# Submissions received (redacted) to Draft Western Lakes Plan





# IFI/2023/1-4647





From: Sent: To: Subject:

Tuesday 20 September 2022 12:35 Western Lakes Plan FW: Western Lakes Plan.

Sent from Mail for Windows

#### From:

Sent: 20 September 2022 12:33 To: westernlakesplan@fisheriesireand.ie Subject: Western Lakes Plan.

Co. Galway.

I am emailing to welcome and support the Western Lakes Plan as outlined. My Family have lived in **Example 1** since the 1900s and we have enjoyed fishing on **Example 1** am a former **Example 1** and now run **Example 1**, through the years **Example 1** fishing has drawn Trout Anglers from all over the world. The protection of this unique Lake and its Native fish species is of the upmost importance to the local economy as it has always been recognized as a Salmon and Trout Fishery world wide, and brings many Trout Anglers to the Village of

I wish IFI success in their endeavour to protect the Lake through this plan and luck in implementing it. Many Thanks for this opportunity to have a say in its future.

Sent from Mail for Windows

From: Sent: To: Subject:

Tuesday 20 September 2022 13:22 Western Lakes Plan Fwd: Western Lakes L Corrib

----- Forwarded message ------

From Date: Tue, 20 Sep 2022, 12:38 Subject: Fwd: Western Lakes L Corrib

Hi,

My name is from in Co Gawlay.

I have read the plan and think that a lot of it is good. But i would like to see more of you officer's here in this area to get all this done.

I think more work has to be done in the spawning grounds In the rivers and streams and the other Lakes that feed into the **Example** These are as important as the Lake itself. These grounds are under pressure from pollution and farming and need to be protected.

The quality of the water in the **second second** area has seriously declined and this needs to be addressed

I am a trout angler and I think the Lake should be managed as a wild trout Lake.

I don't agree with a mixed Fishery of trout, pike and roach. Pike are an invasive species and should not be protected.

I also think that other actions should be addressed in the plan such as controlling mink and cormorant numbers who cause extensive damage to the trout.

A ban on jet skis would also be beneficial in the water quality aspect.



Attn: I.F.I

RE: The Great Western Lakes Draft Management Plan – Submissions.

Dear Sirs,

I wholly support the implementation of a restorative plan for all the SAC lakes.

They have been degrading for decades and the I.F.I. staff numbers allocated to them have drastically reduced over the years. These lakes are our jewels and we have done huge damage to them over the last 50 years due to intensive agricultural practices which have been encouraged by Teagasc and the Department of Agriculture. Global warming has also played a detrimental role in the life cycles of each of the ecosystems.

However, I can't understand why our government continues to support two Bye Laws (806 and 809) which provides protection for invasive species on our SAC's! This is contrary to the E.U. Legislation, are we not members of the E.U.? We are not England! If the mink and rhododendron of Ireland started writing plea letters to our authorities, would our authorities provide protection for invasive mink and rhododendron on our SAC's? How many cases of environmental law must be presented before our courts and E.U. courts before the Irish government understands and accepts its obligations to our primary legislation? Please remove these Bye Laws and let's move on together to protect our heritage.

Regards,



From: Sent: To: Subject:

Tuesday 20 September 2022 13:28 Western Lakes Plan

Hi, please accept the below as my feedback to the requested consultation on the proposed Great Western Lakes Management Plan.

The Great Western Lakes should be managed as Salmonid Fisheries. They should not be considered or managed as "mixed fisheries". They should be managed in line with their Special Area of Conservation (SAC) Status.

Thanks





National Coarse Fishing Federation of Ireland www.ncffi.ie

19<sup>th</sup> September 2022

Inland Fisheries Ireland, IFI

Long Term Management Plan for the Great Western Lakes NCFFI Response to the Draft For Consultation

#### Dear

The National Coarse Fishing Federation of Ireland is the recognised NGB for coarse and predator angling on the island of Ireland. We also represent several game and angling clubs. Affiliated to the used and the several game and angling clubs. Affiliated to the several dependence of the federation hosts world championships in Ireland which serve to showcase and protection of our aquatic biodiversity to anglers worldwide.

Whilst the NCFFI understand the needs of fishery management we object to the unnecessary slaughter of our fish stocks and native wildlife. Already this takes place under the current management of Pike stocks through gill netting and electro fishing on the same waters and will be further enhanced by the removal of statutory protection.

It should be remembered that some of the Western Lakes are also known as top class pike fisheries and accurate to overseas visitors who provide a source of income to these areas.

We see Western Lakes Plan as a backward step in protecting and conserving our freshwater biodiversity and our members do not support nor welcome the Draft Long Term Management Plan for several reasons:

- It proposes the removal of the Pike Bye-law 809 in certain fisheries.
- It proposes the removal of the Coarse Fish Bye-law 806 in the same fisheries.
- The removal of said byelaws on specific fisheries only would increase the difficulty Inland Fisheries already face with fishery protection and would open the door for misinformed anglers to practise catch & kill on all waters.
- It is untenable that a decision is taken to kill more pike and coarse fish to enhance and protect trout stocks. Particularly so, as trout stocks are healthy and the fishing is good. This is not necessarily the case for anglers fishing on the fly who are slow to adapt to a fast changing environment. Limiting the amount and size of trout killed in competition would have a more beneficial effect. At present it is common practise to apply for an exemption to said byelaws for use in competition where all fish are killed. This practise is then replicated by anglers fishing as an individual.



- There is considerable content regarding genetic studies for Pike and their introduction to Ireland which includes research suggesting their presence as 4,000 ybp. How can IFI now determine that they are non-native?
  - There is no proven research that trout are in danger of predation from other species

he term 'newly introduced' which is ambiguou<mark>s. Who will determine</mark> g of this term?

mere brerenere to the stock management of Bream on Lough Mask where Bream are removed and killed with no regard for movement to another location. This, in our opinion, is not stock management. As anglers we always practise catch & release, and our focus is respect for wildlife and the environment. In this context we propose that this plan must include a section outlining details on rehoming of removed fish in suitable waters 'if 'such movement is required.

Management methodologies to include gill netting and electro fishing refer only to the re-homing of coarse fish 'in some instances' and 'where feasible'.

There is mention that there are no stock management measurements for the control of put where they are encountered during other removal programmes they may be retained. But it does not clarify what if any plans are proposed for the coarse fish retained.

heries propose to manage waters such as Lough Sheelin where its primary river, the Inny is a mixed fishery?

It does not focus correctly on the issues facing the fisheries in question with prioritisation on those issues. For example, it is evident that water quality should be the priority #1 in this plan with a focus on stream enhancement works to restore the required environment for spawning.

We believe that this plan would not demonstrate a respect for our freshwater biodiversity and would preserve to disimprove Ireland's image internationally. It would also serve to disimprove Ireland as an attractive and welcoming angling tourism destination.

We have submitted the view of our members, representing coarse, predator and game angling on the island of Ireland to Inland Fisheries Ireland, IFI and the respective Ministers on several occasions as published here <u>https://www.ncffi.ie/the-future-of-coarse-angling-in-ireland</u>

Yours Sincerely,

•



National Coarse Fishing Federation of Ireland

From: Sent: To: Subject:

Tuesday 20 September 2022 13:50 Western Lakes Plan Western lakes development plan

>

> To whom it may concern

> > My name is

. I was born and reared on the shore of Co. Galway. I have fished on

all my life.

> My father made his living from fishing on a s did his

> father before him as did all of the families in the village and along the lake shore.

> My father fished for trout salmon and eels which he was able to sell at that time.

> I can remember my father catching some arctic char in the sixties and early seventies.

> Now the char have become extinct on the **second** and the eels we are

> told are on the brink of extinction. It shocking to think that it has been known for the past 50years that the char were becoming extinct and nothing was done to try and prevent it. But yet in 2006 bye laws were enacted to protect invasive species which may have responsible for the demise of the char.

> I hope that in 50 or 100 yrs. time that people around here won't be

> saying that they remember a time when there were trout salmon and eel

> in **Example 1**. It would be An awful indictment on our generation if that happens. Because it has happened to other lakes in Ireland.

> The biggest treat to **and it**'s native species as I see it, is pollution and invasive species. The removal of the invasive species from the lake in as far as is possible, is critical especially to the **and the system** where the trout and salmon spawn. Also the removable of Bye Laws 809 and 806 which afford protection to pike and other coarse fish, also the implementation of the Habitats Directives which does not allow for the protection of invasive non native fish or plants. This needs to happen urgently not some time in the future when it may be to late.

> I have read the western lakes management plan and I would broadly support it.

> But I would have concerns when I read in it, that studies will have to

> carried out to see if the pike are changing their feeding habits and feeding on roach.

> These studies can take time and we already know from studies as far

> back as the

> 1890 that pike feed almost exclusively on salmonid , and we already know that roach numbers fluctuate in response to environmental variables.

#### >

>

>

> Sent from my iPad





#### Submission on Inland Fisheries Ireland's -

#### Long Term Management Plan for the Great Western Lakes

Document P220901/001

Council of Ireland

#### This submission considers four main issues:

- 1. The biases against non-salmonid stakeholders that the 'Salmonid' tourism designation of the 'Great Western Lakes' imposes on non-salmonid fish species.
- 2. The omittance of the best available scientific evidence within the context of the 'Long Term Management Plan for the Great Western Lakes' proposed by Inland Fisheries Ireland.
- 3. The failure of the 'Long Term Management Plan for the Great Western Lakes' to align with certain High-Level Objectives of Inland Fisheries Ireland's Corporate Plan (2021-2025).
- 4. The potential negative implications and un-certainties of the 'Long Term Management Plan for the Great Western Lakes' on existing native and naturalised species including several species protected by the Habitats Directive, inter-alia the ecological integrity of Natura 2000 sites.

#### **1 REVISION HISTORY**

Revision History		
Revision	Author	Notes
1.0		First Issue

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Appendix H	Comparison of INVAS Biosecurity Ltd. Assessed High Level Objectives & 'Actions' with Inland
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	for the Western Lakes'

#### 2 EXECUTIVE SUMMARY

Inland Fisheries Ireland has initiated a public consultation process to seek submissions on it's 'Long Term Management Plan for the Western Lakes' (The Plan).

Inland Fisheries Ireland (IFI) state within the proposed plan, that through a series of targeted actions, connected to an overall strategy - they will coordinate programmes under 7 categories of High-Level Objectives (HLO). It is further stated that *"each HLO aligns to IFI's Corporate Plan (2021 to 2025)"*. See Corporate Plan at following link: https://www.fisheriesireland.ie/sites/default/files/2021-12/ifi-corporate-plan-2021-2025.pdf.

Section 3 of this submission, amongst fundamental considerations related to the management of the Western Lakes, reviews the plans' HLO's in the context of the IFI's Corporate Plan and discusses areas where IFI's proposed plan fails to align with the HLO's of the Corporate Plan. This section also sets out revised and/or additional proposals regarding 'Actions' related to the plan.

Inland Fisheries Ireland have engaged a consultant (INVAS) to undertake an Appropriate Assessment Screening report of the proposed 'Long Term Management Plan for the Western Lakes'. Inland fisheries Ireland has itself, undertaken a Strategic Environmental Assessment Scoping Report to accompany the plan. This submission considers that both of these reports are deficient in their appraisal of the ecological impact upon Natura 200 sites related to areas of the plan e.g. stock management and stock management operations. Furthermore, the 'Action's contained in the published draft plan for public consultation have been amended by its author's, such that the new 'Actions' in section 11 of the plan, are not the same 'Actions' that were appraised by INVAS. The revision of the plan, pre-public consultation, in itself requires independent investigation to establish who authorised the revision to the 'Actions'; have all of the 'Actions' been approved by the Minister responsible; on what scientific basis did these revisions take place, and why was INVAS not given the revised 'Actions' to review, at Appropriate Assessment screening stage?

Sections 4, 5 & 6 of this submission has incorporated a detailed suite of impacts on Natura 2000 sites that have not been appraised by INVAS or Inland Fisheries Ireland thus far, including a number of 'Potentially Significant' environmental effects will also impact upon human health and the landscape. This submission considers that the plan has the potential to adversely affect the conservation objectives and overall ecology of the Natura 2000 sites and deems that all of the items in section 4 should be fully incorporated, and scientifically assessed by Inland Fisheries Ireland and/or any appointed consultants, during the preparation of Natura Impact Statements, Appropriate Assessments and the Environmental Report prepared in respect of the Strategic Environmental Assessment Scoping Report for this or any future plans related to the Western Lakes.

Appendix D of this plan summarises the submission items included with this submission. Each submission item should be read in conjunction with the specific submission section to which it refers. This submission in its entirety, including all appendices, should be given to current and any future consultants and IFI authors engaged in preparing Natura Impact Statements, Stage 1 & 2 Appropriate Assessments or Strategic Environmental Assessment Scoping / Environmental Reports prepared for this or any future plans related to the management of the Western Lakes.

#### 3 OVERARCHING SUBMISSION RELATED TO THE PROPOSED 'LONG TERM MANAGEMENT PLAN FOR THE WESTERN LAKES'

In response to the invite for submissions regarding Inland Fisheries Ireland's 'Long Term Management Plan for the Western Lakes', a number of overarching headings are discussed in this section to question the appropriateness and validity of the proposed plan.

The headings are as follows:

3.1	The Salmonid Designation – Is it Fit for Purpose?
3.2	Deficiencies in Alignment of the Plan to IFI's Corporate Plan (2021-2025)
3.3	Failure of the Plan to State Salmonid Measurables or Key Performance Indicators
3.4	Failure of Plan to Provide Outline of 'Funding' and 'Staffing' Required for Implementation
3.5	Economic and Ecological Deficiencies Related to the Plan Regarding the Management of Pike Apparent Over-Reach of the Proposed Plan
3.6	Strategic Environmental Assessment - Natura Impact Statement & Appropriate Assessment
3.7	Table of Submission Comments & Proposed Amendment / Additions to Plan 'Actions'

#### 3.1 THE SALMONID DESIGNATION - IS IT FIT FOR PURPOSE?

Historically, a number of large limestone lakes in the west of Ireland have been managed *"preferentially"* as wild brown trout fisheries (Ref: 'Long Term Management Plan for the Western Lakes').

However, Inland Fisheries Ireland (IFI) has a statutory remit under the Inland Fisheries Act of 2010 - to protect, conserve and manage Irelands inland fisheries resources.

This submission recognises the inherent ability of the catchments of the Western Lakes to provide for sustainable salmonid stocks into the future with a programme of protection and rehabilitation measures attached to spawning and nursey streams and rivers within each catchment along with increased protection from water pollution. While the Western Lakes are of unique ecological importance in their own right, they are not solely unique wild brown trout habitats. The lakes, due to their ecological qualities, have since their formation provided a unique habitat for all species present.

The over-riding question to be answered is why Inland Fisheries Ireland continues to pursue fish stock management on the Western Lakes, particularly in an ever-changing ecological climate and one very much different to the 1950's, and why and how does it link the 'salmonid designation' to removing other fish species. This same question is asked by Inland Fisheries Ireland's Research Division (Ref: Appendix 4), yet the question remains unanswered in light of current scientific evidence to the contrary.

#### 3.1.1 RISK ASSOCIATED WITH CURRENT TOURISM BRANDING OF THE 'WESTERN LAKES'

The Western Lakes, as they are known, have been branded as salmonid lakes since the 1950's, principally by Bord Fáilte to promote trout angling tourism (Ref: FOI, Email of 6th October 2016 – See Appendix A).

IFI and its predecessors have since that time, retained this original 'tourism' designation and widened the scope of "salmonid" to include salmon, with the advent of the EU Habitats Directive. The designation such as it is, has become a springboard for IFI over the past seven decades, to justify the artificial manipulation of fish stocks, principally by removing pike.

The outcome of this approach has been to:

1) Mask the true impact of failing to address the real issues affecting the Western Lakes i.e. declining water quality, nutrient enrichment and habitat destruction as particularly evidence on Lough Sheelin, and

2) Starve local communities around the Western Lakes of potential specialist pike angling tourism revenue.

It is known that while angling for pike and indeed coarse fish in Ireland in the 1950's by Irish anglers was in its infancy, adventurous English pike anglers during the reign of Queen Victoria visited the Western Lakes to enjoy highquality pike, trout and salmon fishing that was available at that time (Ref: Mammoth Pike – Fred Buller, 1979).

Pike anglers, as stakeholders who live on; those who operate pike angling guiding services and those who regularly visit to fish the Western Lakes will be marginalised further by the 'salmonid' designation and the 'Actions' outlined in the plan.

The 'Long Term Management Plan for the Western Lakes' will apply to 7 of Ireland's largest lakes (i.e. Corrib, Mask, Carra, Conn, Cullin, Arrow and Sheelin). Together they comprise approximately 27% of the total surface area of angling lakes within the State and will be a significant loss to Ireland's non-salmonid tourism market as a result of the 'Actions' contained in the current plan.

#### Section 3.1.1 - Proposed Management Plan – Submission Item:

 This submission considers that all species can be accommodated on the Western Lakes without compromising the status of the lakes as producers of quality trout and salmon angling – provided only, that measures specifically designed to elevate the importance of the spawning and nursery catchments, and water quality issues, are the primary focus of the plan.

#### 3.1.2 FAILURE TO ACKNOWLEDGE AND PROMOTE THE 'WESTERN LAKES' FOR PIKE ANGLING TOURISM

Angling in Ireland and the Irish angling tourism sector has progressed significantly since the 1950's. Pike angling in particular in the western lakes has become a significant attraction for domestic and overseas angling tourists, who seek really big pike in the 30lb to 40lb size bracket, many of them driven by 'Mammoth Pike', a book written in the 1970's by the late Fred Buller, an angling historian.

In 2015 Inland Fisheries Ireland produced a document outlining market research into angling in Ireland for the 'National Strategy for Angling Development'. Sources for information included Fáilte Ireland and Tourism Development International and utilized data from online surveys. According to the document, pike angling in the year 2015 was worth €102m to the Irish economy and trout angling was worth €148m during the same year.

See:

https://www.fisheriesireland.ie/sites/default/files/migrated/docman/2015/nsad/NSAD%20Work%20Package%203% 20FINAL%2018Nov15.pdf

#### The market research found the following in relation to Ireland's Pike Angling Product:

"Pike is the number one sport fish in Germany, France, the Netherlands and Italy and also quite popular amongst anglers in the UK. Irish pike have a world-wide reputation as extremely hard fighting, fast growing

#### and powerful predators. Ireland boasts an incredible number of top-class pike fisheries including the Shannon and Erne catchments, the Cavan/Monaghan Lakelands and the Great Western Lakes.

Additionally, there are myriads of other smaller, seldom fished pike waters which provide excellent sport for the more adventurous angler. All of this makes Ireland probably the number one pike angling destination in Europe; only to be rivalled by North America and Alaska's Northern Pike and Muskie fisheries. Our biggest competitors in Europe would include Sweden and the Bodden fisheries off the German Baltic coast."

#### The research also stated the following regarding Ireland's Policies regarding Pike Management:

"Pike angling is one of our strongest products and should be promoted in most countries but particularly in Germany, the Netherlands, Italy and France. **However, current pike management policies may impact negatively on Ireland's reputation as a prime pike angling destination**".

While it may be argued that a policy for fisheries management on waters containing salmonids should seek the highest environmental standards in the interest of sustainable salmonid populations for angling tourism and to meet EU requirements, the inference that culling and removing other species is acceptable, is both ecologically unsound, but it also has negative consequences for pike angling tourism in general.

#### Section 3.1.2 - Proposed Management Plan – Submission Item:

 This submission considers that the salmonid designation should be reviewed in terms of how Inland Fisheries Ireland links culling to the designation, and as such, this submission proposes that an angling tourism product risk review regarding angling for all species affected in the Western Lakes and also generally to Ireland's angling tourism product takes place, before any plan regarding the Western Lakes is adopted.

#### 3.1.3 MARGINALISATION OF PIKE ANGLING STAKEHOLDERS

Inland Fisheries Ireland's Corporate Plan (i.e. HLO 03 – Action 3.2), states that Inland Fisheries Ireland will manage state owned fisheries "*sustainably for the benefit of all stakeholders*". The proposed plan does not deliver on this high-level objective. The proposed plan instead adopts a preferential position with regard to trout angling tourism and stakeholders, at the expense of pike angling tourism and indeed potential coarse angling tourism opportunities for local economies and angling tourism providers around the Western Lakes – some of which are leaving the angling tourism sector. The marginalisation of pike angling and other non-salmonid stakeholders potentially impacts upon the sustainability of Multi-Season angling tourism on the Western Lakes and potentially the attractiveness of the locales to new entrants to the angling tourism market.

#### Some businesses for sale at the time of writing:

https://www.daft.ie/for-sale/detached-house-corrib-wave-house-corrib-wave-house-connemara/3699810 https://www.daft.ie/for-sale/detached-house-oughterard-holiday-hostel-and-angling-centre-station-roadoughterard-co-galway/3997751 https://www.daft.ie/for-sale/detached-house-portarra-lodge-moycullen-co-galway/4024192 https://www.daft.ie/commercial-property-for-sale/fairhill-house-hotel-main-street-clonbur-co-galway/3728509

#### Section 3.1.3 - Proposed Management Plan – Submission Item:

This submission considers that the plan does not meet Inland Fisheries Ireland's Corporate Plan (i.e. HLO 03

 Action 3.2) objective to manage state owned fisheries for the benefit of all stakeholders, and therefore the plan marginalises non-salmonid stakeholders, and discriminates against pike angling stakeholders in particular, and coarse angling stakeholders generally.

#### 3.1.4 PIKE CONSERVATION - PROTECTION OF THE UNIQUE "IRISH STRAIN"

Scientific research indicates that pike may have first naturally colonized Ireland 8000 years ago (Pedreschi et al. 2014). Inland Fisheries Ireland released a statement on 15th October 2013, that "New Study Reveals Pike Native to Ireland".

In 2018, Dr. Pedreschi met with the review group established by Inland Fisheries Ireland to review their current pike management policy on brown trout fisheries. Dr. Pedreschi stated that her research regarding pike colonization was continuing, albeit slowly, however Dr. Pedreschi confirmed that the additional research using single nucleotide polymorphism (SNPs) was supporting the original conclusions. The conclusions of the paper were questioned by D. Ensing (2015) who suggested that pike could have been introduced by man 4000 years ago. Pedreschi & Mariani (2015) responded to Ensing in a published paper entitled "Towards a balanced view of pike in Ireland: a reply to Ensing" and stated their contention that Ensing's theory did not fit with the available scientific and historical evidence and that the opinion expressed was "too speculative and unsupported by data".

The implications of the research undertaken by Dr. Pedreschi is that we now can appreciate that a "unique Irish strain" of pike, linked through genetics may inhabit some of the Western Lakes e.g. Corrib, despite contrary historical data held by Inland Fisheries Ireland, that has yet to be scientifically verified.

#### Section 3.1.4 - Proposed Management Plan – Submission Item:

- This submission considers that DNA evidence suggests that the plan does not meet Inland Fisheries Ireland's Corporate Plan (i.e. HLO 02 – Action 2.3) objective to develop fishery management plans in light of best evidence-based research and modelling available, based upon the possibility that the plan seeks to remove and cull a potentially unique strain of naturally colonised native Irish pike from the Western Lakes, and as such all culling and removal of pike should cease.
- 2) This submission considers that in light of the conclusions of Pedreschi & Mariani (2015) stating that many ubiquitous freshwater species in Ireland remain to be investigated such as gudgeon, stoneloach, minnow and perch, that scientific research should now be undertaken by Inland Fisheries Ireland to scientifically examine the possible native status of these additional species and that Inland fisheries Ireland should advise of its intentions in this regard.

#### 3.1.5 ARE BROWN TROUT POPULATIONS PROTECTED AND/ OR AT RISK

The 'Long Term Management Plan for the Western Lakes' prioritises a fish species (brown trout) that is:

- a) Not under threat of extirpation or extinction;
- b) Is not an annex ii species as defined by the EU habitats directive;
- c) Is the most common and wide spread fish in Ireland (ref: IFI website);
- d) Is not on any environmental protection Red List;

This prioritisation of brown trout in the plan, compromises the objectives of the EU Habitats Directive for SPAs, SACs and Natura 2000 sites and puts at risk many of their Qualifying Interests by adding pressures such as:

- a) Unquantified predation and competition pressure as a result of an artificially enhanced/ managed wild brown trout population on Annex II Salmon;
- b) Potential compromise of Otter Habitat by stock management operation's;
- c) The potential spread of invasive weed species (L. Major) by stock management operations;

#### Section 3.1.5 - Proposed Management Plan – Submission Item:

- 1) This submission considers that the artificial increase of the brown trout populations above natural capacity on the Western Lakes inter-alia the management culling operations executed on other species in that pursuit, compromises the objectives of the EU Habitats Directive for SPAs, SACs and Natura 2000 sites and puts at risk many of their Qualifying Interests and as such should be reviewed in the context of a Natura Impact Statement and Appropriate Assessment carried out on the Natura 2000 sites.
- 2) This submission considers that Inland Fisheries Ireland should provide data on biomass, density and length frequency distribution of the current existing trout stocks in each of the Western Lakes and also the optimum trout stock that it considers stocks need to be increased to, or reduced by to ensure a sustainable trout stock in each of the Western Lakes, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.
- 3) This submission considers that Inland Fisheries Ireland should provide data on biomass, density and length frequency distribution of the current existing pike stocks in each of the Western Lakes and define what the numerical objectives of the plan are in regard to those stocks, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

- 4) This submission considers that Inland Fisheries Ireland should provide data on biomass, density and length frequency distribution of the current existing perch, roach and bream stocks in each of the Western Lakes and define what the numerical objectives of the plan are in regard to those stocks, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.
- 5) This submission considers that Inland Fisheries Ireland have not provided for any additional trout angling conservation regulations within the 'Long Term Management Plan for the Western Lakes' and that Table 1 (P17) of the plan clearly defines a wide variance in current regulation (e.g. 2 fish per day legally killed on Lough Sheelin to unlimited killing of trout per day on Lough Conn and Cullin), reflecting a loose conservation of trout on the Western Lakes, and therefore reflecting the prevalence of trout believed to presently exist on the Lakes, and as such Inland Fisheries Ireland are requested to provide scientifically based reasons for this omission, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

#### 3.1.6 FISHERY UTILITY AND COMMUNITY INTEREST

The plan states that *"The protection of other species and habitats of community interest, which are also important to the health and wellbeing of these important aquatic ecosystems, is also a vital component of the plan."* 

The plan fails to assess or acknowledge the fishery utility/community interest relating to non-salmonid species. The plan suggests that fishery utility may increase by implementing the measures outlined in each HLO, however, the plan does not consider the negative impact on fishery utility as a result of the destruction of non-salmonid fish stocks. The proposed actions in the plan have wide ranging effects relating to local non-salmonid anglers, local fishing guides, service and accommodation providers.

#### Section 3.1.6 - Proposed Management Plan – Submission Item:

1) This submission considers that the proposed plan does not align with Inland Fisheries Ireland's Corporate Plan - HLO 03 – Action 3.2 in the first instance at high-level for the benefit of all stakeholders (See P45, 46 & 47 - Actions 4.1, 4.4, 5.1, 5.3 & 5.4 of the plan). Therefore, it is requested that IFI show how it has engaged with non-salmonid stakeholders (e.g. pike anglers, local businesses such as pike angling guides, pike angler friendly accommodation and local services etc.), to specifically assess community interest and fishery utility impact relating to the artificial and purposeful destruction of their fish stocks within the proposed plan, inter-alia the decreased utility of the fishery?

#### 3.1.7 HISTROICAL EVIDENCE OF THRIVING SALMONID POPULATIONS

There is a long history of commercial fish cropping and angling related mortality of trout on some of the lakes targeted by the plan e.g. Lough Corrib.

Historical records show that pike, salmon, eels and other fish species have been harvested for commercial purposes for almost 500 years on Lough Corrib (Ref: email to IFI).

In the early 20<sup>th</sup> century reports from the Lough Corrib Fisheries Association estimated that between 30 and 40 tons of trout were being taken on rod and line each season (Ref: Salmon and Trout Magazine, 1959). Commercial trout harvesting operated on Lough Corrib until at least the mid 1970's (Ref: IFI Data).

Historical angling records show that despite intense angling and commercial operations and the presence of pike in the lakes, the salmonid populations were thriving.

In relation to stock management the proposed plan does not adequately consider this historical evidence which indicates the real link between large self-sustaining salmonid populations and pristine ecological conditions, and instead focuses on a biomanipulation of non-salmonid fish stocks to buffer against salmonid diminution.

In this regard, salmonid anglers should be extremely concerned about the over-reliability by IFI on stock management within IFI management plans related to the Western Lakes.

#### Section 3.1.7 - Proposed Management Plan – Submission Item:

 This submission considers that Inland Fisheries Ireland should review historical data relating to habitat destruction and water quality reduction on each of the Western Lakes to establish salmonid population responses related to environmental improvement on each of the Western Lakes.

#### 3.2 DEFICIENCIES IN ALIGNMENT OF THE PLAN TO IFI'S CORPORATE PLAN (2021-2025)

The Research Division of Inland Fisheries Ireland has previously advised Inland Fisheries Ireland's management of the specific role that science has in informing policy and management in Ireland's fisheries.

(See Research Division Document – "The role of IFI science in informing policy and management in fisheries" Appendix G)

The above document notes that *"the provision of robust science by RD places IFI in a solid position to implement best practice evidence-based management (EBM)".* 

The document further states that evidence-based management aims to *"explicitly use the current, strongest evidence in management and decision-making, where the first principle is to employ published peer-reviewed scientific research that bears on whether and why a particular management practice is likely to work".* 

This submission is of the considered view that the 'Long Term Management Plan for the Western Lakes' has provided no evidence that it is founded upon best practice evidence-based management (EBM).

#### 3.2.1 FAILURE TO BASE PROPOSED PLAN ON BEST EVIDENCE BASED RESEARCH

Inland Fisheries Ireland's Corporate Plan (i.e. HLO 02 – Action 2.3), states that Inland Fisheries Ireland will develop fishery management plans *"in light of best evidence-based research and modelling available"*. In the first instance to *"assist in the management of wild brown trout fisheries manage state owned fisheries"*.

The Corporate Plan specifically promotes a "*science-based policy*" supporting the rationale for managing managed wild brown trout fisheries "*in a sustainable manner*". The Corporate Plan does not specifically promote the removal of non-salmonid fish species within the context of a sustainable management model.

It is considered in this submission that the proposed plan does not deliver on this high-level objective. The proposed plan instead refers to "recent studies" but does not directly base any of the' Actions' within the Plan on the worldwide acknowledged scientific evidence presented in these studies.

It should also be acknowledged that the scientific research undertaken since 2013 has resulted in suite of peerreviewed research papers upon which Inland Fisheries Ireland can base its management plans. (See Appendix C). Much of this research has been supported by DECC funded programmes, undertaken by or in co-operation with Inland Fisheries Ireland, and in some cases, within a Memoranda of Understanding with University College Dublin. The following are links to the best evidence-based research currently available to Inland Fisheries Ireland:

- <u>https://www.researchgate.net/publication/257967424 O R I G I N A L A R T I C L E Genetic struct</u> ure of pike Esox lucius reveals a complex and previously unrecognized colonization history of Irela <u>nd</u>
- <u>https://www.researchgate.net/publication/281635920\_Trophic\_flexibility\_and\_opportunism\_in\_pike\_Esox\_lucius</u>
- <u>https://www.researchgate.net/project/Pike-in-Ireland-Developing-Knowledge-and-Tools-to-Support-Policy-and-Management</u>
- <u>https://www.researchgate.net/publication/327865921 Coexistence of pike Esox lucius and brown trou</u> <u>t Salmo trutta in Irish lakes</u>
- https://doi.org/10.1016/j.ecolmodel.2019.108740
- Shifts in diet of an apex predator following the colonisation of an invasive fish | SpringerLink
- <u>https://www.researchgate.net/publication/328814887</u> Salmonid Conservation in an Invaded Lake Changing Outcomes of Predator Removal with Introduction of Nonnative Prev

The document entitled **"The role of IFI science in informing policy and management in fisheries"** (See Appendix G), describes further, Inland Fisheries Ireland's most recent peer-reviewed and published research. These papers were published as part of the McLoone (2018) pike project entitled **'Pike (Esox Lucius) in Ireland: developing Knowledge and tools to Support Policy and Management'**. The pike project set out in a series of papers, the learnings on the Western Lakes and changes in the lakes over many decades including the dynamics of fish communities in response to environmental changes during that period.

Inland Fisheries Ireland's Research Division stated that *"The Key findings from the Inland Fisheries Ireland pike* project were published as four peer-reviewed papers in international scientific journals. These journals are highlyregarded and report science that strongly informs fisheries and environmental policy worldwide. The papers have been well received, including winning an international award for scientific excellence. The set of publications highlight limitations and avenues for future research, but provide a solid foundation for evidence-based fisheries management at IFI".

#### Section 3.2.1 - Proposed Management Plan – Submission Item:

1) This submission considers that the proposed plan does not align with Inland Fisheries Ireland's Corporate Plan - HLO 02 – Action 2.3 in the first instance at high-level (See P45, 46 & 47 - Actions 4.1, 4.4, 5.1, 5.3 & 5.4 of the Plan). Therefore, it is requested that Inland Fisheries Ireland provide definitive scientific comment that shows that the plan has been appraised, based upon evidence-based management (EBM) and shows how the best peer-reviewed scientific evidence available has been used to support each of the individual actions mentioned in this item, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

#### 3.2.2 CONCERNS RAISED BY THE IFI RESEARCH DIVISION

The Freedom of Information Act has been used to request information from Inland Fisheries Ireland regarding the application of scientific evidence inter-alia advice given from the Research Division to the Chief Executive Officer of Inland Fisheries Ireland regarding pike.

One of the documents received, entitled **"The role of IFI science in informing policy and management in fisheries"** (See Appendix G), clearly expressed some **"extremely serious concerns**" regarding the intention of Inland Fisheries Ireland's Development Section to allow anglers to participate in culling pike. Action 4.4 and 5.3 (See P46 & 47) of the 'Long Term Management Plan for the Western Lakes' proposes to **"encourage"** and **"enable local stakeholders"** to cull pike on rod and line.

The clear intention of the plan is to remove the pike bye-law (809 of 2006) and the coarse bye-law (806 of 2006) on the Western Lakes (See P37 & P38). However, the plan provides no scientific evidence to support these actions, nor does it provide evidence that there will be an increased abundance of trout or salmon as a consequence.

The questions raised by the Research Division are as pertinent now as they were when they were written. The proposed plan does not in any way provide an answer to the *"extremely serious concerns"* expressed by the Research Division.

At a minimum IFI Development and Management are required to consider and produce detailed answers to the concerns raised, based upon the most recent and best available scientific research available. In relation to stock management, the proposed plan should not proceed, prior to addressing all of the items raised by the IFI Research Division as many of these concerns relate to the outcome of stock management, by whatever form.

This information should be published and form part of the supporting documentation made available to stakeholders for consideration in the public consultation process and to the independent consultants to inform the Natura Impact Statement and Appropriate Assessment regarding the High-Level Actions contained in the plan.

The public consultation process should be deemed compromised in the absence of this information.

#### Section 3.2.2 - Proposed Management Plan – Submission Item:

- 1) This submission considers that the proposed plan has not addressed the "serious concerns" expressed by Inland Fisheries Ireland's Research Division regarding the document entitled **"The role of IFI science in informing policy and management in fisheries"** relating to Action 4.4 and 5.3 (See P46 & P47) of the 'Long Term Management Plan for the Western Lakes'. Therefore, it is requested that Inland Fisheries Ireland's Development Section and Senior Management provide definitive scientific comment on each of the 45 queries raised by the Research Division in the aforementioned document, and that these are made publicly available, prior to proceeding further with the proposed plan, or any future management plans or activities planned for the Western Lakes.
- 2) The document entitled "The role of IFI science in informing policy and management in fisheries" states that the stock size for brown trout and pike "is unknown" on the Western Lakes" and questions "on what basis is culling effort being defined". It is requested here that Inland Fisheries Ireland's Development Section and/or Chief Executive Officer provide the evidence-based research to support culling effort in response to this query regarding pike stock management proposed within the following:
  a) The proposed plan, and
  - b) The current 2022 pike management plans presently being enacted on each of the Western Lakes.
- 3) This submission considers that the proposed plan has not provided any evidence to show that the pike stocks in each of the individual Western Lakes are large and in need of reducing. It is requested here that Inland Fisheries Ireland provide the evidence-based research that has determined that stocks need reducing, for each individual Western Lake.
- 4) This submission considers that recent international scientific publications from Inland Fisheries Ireland's own Research Division indicate that pike removal may have a neutral or negative impact on brown trout populations in lakes having established roach populations. It is requested here that Inland Fisheries Ireland provide details of peer-reviewed evidence-based research that is being used to justify the removal of pike as a brown trout stock enhancement tool within:
  - a) The proposed plan, and
  - b) The current 2022 pike management plans presently being enacted on each of the Western Lakes.
- 5) This submission considers that the proposed plan has not provided any evidence to show what outcome the stock management element of the proposed plan will have on the fish community dynamics and brown trout abundance in each of the Western Lakes. It is requested here that Inland Fisheries Ireland provide details of peer-reviewed evidence-based research to show what improvement in brown trout abundance and salmon and fish community dynamics generally will take place on each of the Western Lakes, in response to:
  - a) The proposed plan, and
  - b) The current 2022 pike management plans being enacted on each of the Western Lakes.

#### 3.2.3 THE ROLE OF IFI SCIENCE IN INFORMING POLICY AND MANAGEMENT IN FISHERIES

The website of Inland Fisheries Ireland (IFI) states that the Research Division (RD) carries out applied fisheries research to assess the conservation status of Ireland's fish species, to monitor fisheries stocks in inland and coastal waters and to explore environmental issues that have an impact on fish and their habitats.

The Research Division also provides scientific advice to IFI's parent department, the Department of the Environment, Climate and Communications.

The document entitled **"The role of IFI science in informing policy and management in fisheries"** (See Appendix G), advises that the research and advice function of the Research Division (RD) is **"consistent with the purpose of similar** groups worldwide, who strive to provide independent and unbiased scientific understanding which can inform policy and management".

The document states that the "provision of robust science by the Research Division places IFI in a solid position to implement best practice evidence-based management (EBM)". It further states that EBM aims to "explicitly use the current, strongest evidence in management and decision-making, where the first principle is to employ published peer-reviewed scientific research that bears on whether and why a particular management practice is likely to work".

The Research Division place emphasis on scientific evidence to **"provide an explicit means by which bias in the** system can be minimized". The principle on which the Research Division rely **"strongly contrasts EBM with weaker** management alternatives based on subjective perception, i.e., hearsay, opinion, belief or advocacy".

The proposed plan states that the "management of pike stocks has been ongoing for over 5 decades, on the western lakes. This has always been regarded as an important management tool for the conservation of salmonids" (P38). There is an inference from this statement that as this is how things were done, the status quo should continue. However, the statement is in itself erroneous and not supported by results. By contrast, the Research Division, having reviewed Inland Fisheries Ireland's own published research conclude that "The ecology of the designated Irish trout Lakes has changed markedly since the 1960s, when these systems were reasonably pristine and the fish community was dominated by brown trout and pike". The RD further state that "The lakes currently experience impacts from agricultural run-off, invasive species, angling and other human pressures. These factors probably interact to influence the fish community and the relative abundance of particular species. The impact of invasive roach populations is likely to be particularly important".

The Research Division conclude, in contrast to the comments presented in the proposed plan, that *"in this complex environment, the effect of removing a predator such as pike is difficult to predict and may be negative. The IFI studies suggest that pike removal may have benefited trout in the simpler fish communities occupying healthier lake systems in the past. This management practice is likely to be much less effective in the current impaired situation".* 

This submission considers that the 'Long Term Management Plan for the Western Lakes' has not been informed by "best practice evidence-based management", and that the outcomes of the plan are highly un-certain and are likely to impact negatively upon the ecology of each of the Western Lakes.

#### Section 3.2.3 - Proposed Management Plan – Submission Item:

- 1) This submission considers that the stock management aspect of proposed plan is not informed by "best practice evidence-based management (EBM)" and as such, Actions 4.1, 4.4, 5.1, 5.2, 5.3 & 5.4 (See P46 & P47) of the proposed 'Long Term Management Plan for the Western Lakes' are likely to lead to adverse and uncertain impacts on the Natura 2000 sites and should be removed from the plan. In addition, there has been no evidence provided to show how these risks have and would be considered at High-Level stage in the form of a Natura Impact Statement (NIS) and Appropriate Assessment (AA) specifically for each of the High-Level Actions mentioned in this section.
- 2) This submission proposes in the first instance, that stock management ceases on each of the Western Lakes pending a review of the application of existing best evidence peer-reviewed research, and the completion of any continued long-term studies (e.g. per IFI document IFI/2021/1-4562) to align any future stock management proposals to Inland Fisheries Ireland's Corporate Plan (2021-2025) HLO 02 Action 2.3.
- 3) This submission requests an answer to the query raised by the IFI Research Division (Appendix G) to IFI Management requesting on what scientific basis is it known that "it is essential that pike stocks are kept under control" The proposed Plan provides no published scientific evidence to answer this fundamental question regarding the Western Lakes on the basis of the current scientific evidence, and it is requested here that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

#### 3.2.4 PIKE IN IRELAND – CONTINUED LONG TERM STUDIES

Inland Fisheries Ireland's Research Division have proposed additional research on the Western Lakes to progress the research of McLoone et al., 2018. The Research Division state that the research will provide *"Important additional knowledge of predator-prey and competitive interactions will inform full development of a size-based mathematical model of the lake fish community".* 

The Research Division state that *"this kind of model is used globally to support best practice Management Strategy Evaluation (MSE) that can support managers by exploring the likely impact of candidate fisheries management actions".* 

The additional research proposal indicated by the Research Division meets the requirement of two high level objectives of IFI's Corporate Plan 2021-2026 HLO 2 and 3.

- Action 2.2: Implement evidence-based species policies and programmes with a focus on mitigation and adaptation in an era of climate change.
- Action 2.3: Develop modelling tools to support scientific evaluation of candidate fisheries management actions. In the first instance to assist in the management of wild brown trout fisheries.

This submission considers that unlike the proposed 'Long Term Management Plan for the Western Lakes', the continued study does not pre-determine the requirement for any course of action regarding stock management, but instead seeks to scientifically evaluate predator-prey and competitive interactions in candidate fisheries, namely Lough's Corrib, Mask and Carra. In this regard, any stock management should not precede the completion of the proposed continued long-term studies and until water quality and habitat improvement measures are complete, so as not to undermine management interventions directly disconnected to stock management.

The proposed study will take place over 4 years at the total cost of €1,371,536 to include additional stock surveying techniques. Gastric lavage (stomach flushing) as a non-lethal method of obtaining dietary information will be employed on the project (as per HLO1) (McLoone et al., 2018). It is intended that a citizen science aspect of the research will be managed through a series of IFI hosted non-lethal pike angling competitions. The proposal in full is contained in Inland Fisheries Ireland research document **IFI/2021/1-4562**.

#### Section 3.2.4 - Proposed Management Plan – Submission Item:

- This submission considers that the continued research proposed by the Research Division (See IFI/2021/1-4562) represents an opportunity to build upon the existing research and to inform management, without dismissing the existing findings of McLoone et al., (2018). It is proposed that this research:
  - A) Is undertaken in full prior to any stock management decisions taken on the Western Lakes,
  - B) That Inland Fisheries Ireland confirms that funding has been secured to complete the research, and
  - C) That Inland Fisheries Ireland confirms the precise commencement and completion dates of the study.

#### 3.2.5 IFI RESEARCH DIVISION - ISSUES WITH CURRENT PROPOSAL FOR CITIZEN SCIENCE

Inland Fisheries Ireland's use of 'Citizen Science' is not new e.g. <u>https://www.fisheriesireland.ie/news/press-</u> releases/currane-anglers-are-needed-for-citizen-science-survey-to-examine-fish-stocks

The potential use of the angling community in the Western Lakes to feed data into research that will be scientifically peer-reviewed is considered in the 'Long Term Management Plan for the Western Lakes'. In some locales around Lough Corrib, pike have been treated very poorly with carcasses hung from trees and from signs at slipways such as the examples in the photos. This deep-seated hatred is being fuelled by S59's authorised by Inland Fisheries Ireland.

Facebook pages also exist related to Lough Corrib, that present images of dead and dissected pike; predisposing the neutral angling community to images and comments that reflect a preconceived idea that pike should be managed on Lough Corrib.

The current Section 59 authorisations given to a minority of anglers on the Western Lakes are also done so, without the benefit of Inland Fisheries Ireland having applied best practice evidence-based management (EBM), and without knowledge of the stock size of wild brown trout or pike.

This submission considers that Section 59 authorisations should cease immediately, and that 'Citizen Science' be based entirely upon non-lethal capture and return of pike in the creation of a single unified process to be applied by all anglers of differing stakeholder groups. It is considered in this submission, that such a unified non-lethal approach will encourage a high level of participation across all stakeholder groups and place emphasis on scientific evidence to *"provide an explicit means by which bias in the system can be minimized"* as previously discussed as stated by the Research Division of Inland Fisheries Ireland.





Lough Corrib Island – Witnessed by Children

#### Section 3.2.5 - Proposed Management Plan – Submission Item:

- This submission considers that the continued research proposed by the Research Division (See IFI/2021/1-4562) contains a 'Citizen Science' element. It is proposed here that any engagement with anglers in the collection of samples or during competitions / events of any kind, is informed by detailed information and a Standard Operating Procedure drafted between the Research Division and Pike Angling National Bodies, to include, but not be limited to:
  - A) Agreed conditions of engagement;
  - B) The creation of a register for anglers from which anglers can be added, or removed;
  - C) Description of all aspects of the process such as non-lethal handling and retention;
  - D) Minimum requirement for angling equipment;
  - E) Prior IFI Management response to all 45 questions drafted by the Research Division in document entitled "The role of IFI science in informing policy and management in fisheries";
  - E) Cessation of all IFI Section 59 authorisations to cull pike on the Western Lakes;

#### 3.2.6 IFI ADAPTIVE MANAGEMENT PROPOSALS

Water quality decline is linked to fish species density (e.g. Salmonids and Coarse Fish) and is a significant driver of ecological changes in the Western Lakes. Lough Sheelin in particular, is a prime example of how water quality can shape species density of salmonids and coarse fish, particularly over the past 4 decades.

The proposed plan embraces the concept of 'Adaptive Management', however it does not define how it will monitor and assess the outcome of water quality improvement or the water quality parameters that it will link to the environmental improvement of the Natura 2000 sites and hence, the improvement of salmonid stocks. The sustainability of future salmonid stocks relies upon pristine water quality as a prerequisite and as such, should be the primary management focus of the "long term plan for the Western Lakes".

#### Section 3.2.6 - Proposed Management Plan – Submission Item:

1) This submission proposes that It will be necessary for Inland Fisheries to detail an 'Adaptive Management Programme' to scientifically research the link between water quality improvements and fish species responses in the Western Lakes and secure specific funding from DECC for enhanced ecological testing and monitoring to facilitate the programme, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

#### 3.3 FAILURE OF PLAN TO STATE SALMONID MEASURABLES OR KEY PERFORMANCE INDICATORS

The proposed plan does not detail the measurables and parameters upon which the success of the proposed plan will be measured.

#### 3.3.1 KEY PERFORMANCE INDICATORS & MANAGEMENT STRATEGY EVALUATION

As there is no definition of measurables or parameters the proposed plan has failed to detail any metrics that will be used to assess the success, failure or progression of the proposed plan.

Due to the current practice of artificial stock manipulation by IFI the plan has not detailed how a baseline for any measurables or parameters will be reached.

Due to the current practice of artificial stock manipulation by IFI, the establishment of baseline metrics is severely impacted and therefore compromises the plan.

Baseline metrics can only be established following a lengthy moratorium on all artificial stock manipulation (for all fish species), including stock management operations and the removal of fish (all species) by anglers.

#### Section 3.3.1 - Proposed Management Plan – Submission Item:

 This submission considers that the plan, without baseline data is compromised, as its success, failure or progression cannot be quantified due to the absence of baseline data. In order to obtain baseline data it is suggested that the following actions be undertaken:

A) Cease all artificial stock manipulation by ceasing all stock management operations;

B) Cease all artificial stock manipulation by introduction of a mandatory catch and release policy for all species;

C) Implement habitat restoration and enhancement programs to bring salmonid spawning catchment to their maximum carrying capacity for salmonids;

D) Implement an aggressive program of water quality monitoring, improvement and remediation;

E) Clearly define parameters based on upon the previous actions to aid in establishing a timeline for stock baseline estimation;

## 3.4 FAILURE OF PLAN TO PROVIDE OUTLINE OF 'FUNDING' AND 'STAFFING' REQUIRED FOR IMPLEMENTATION

The proposed plan states that Section 11 contains details of *"the resources required to implement the plan including an outline of funding and staff required is also presented"* (ref: page 8)

However, Section 11 does not in any way, set out the resources required to implement the plan. In contrast, section 11 states *"If adequate resources are not engaged in the delivery of the actions, their delivery may not happen or may be delayed"*.

This submission considers that the failure to precisely detail the resources and funding required for the plan entirely undermines the validity of the plan.

At a more fundamental level, the plan fails to provide any evidence that the DECC or other relevant funders have approved the necessary allocations required to implement, in particular, the more positive scientific research elements of the plan.

Section 3.4 - Proposed Management Plan – Submission Item:

- 1) This submission proposes that It will be necessary for Inland Fisheries to detail precisely the resources, funding and staffing levels required for each High-Level Action in the plan and clarification is hereby requested, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.
- 2) It is hereby requested that Inland Fisheries Ireland clarifies if the full funding of €1,371,536 has been secured for the continuation of Long-Term Studies on the Western Lakes as outlined in IFI document IFI/2021/1-4562 and confirmation of the commencement and completion of the 4-year research programme, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

#### 3.5 ECONOMIC AND ECOLOGICAL DEFICIENCIES RELATED TO THE PLAN REGARDING THE MANAGEMENT OF PIKE – APPARENT OVER REACH OF THE PROPOSED PLAN

The Irish Federation of Pike Angling Clubs and The Irish Pike Society drafted a document specifically for the Pike Policy Review of 2016-2018 which was originally initiated by Inland Fisheries Ireland, following pike angler outcry at Inland Fisheries Ireland's own abuse as shown in publicised video footage, of the previously agreed pike policy of 2012-2014.

#### The document entitled **"Economic and Ecological Effects of Pike Management Operations Conducted by Inland** Fisheries Ireland and Deficiencies in its Justification", is attached in Appendix F.

The document sets out many issues that remain to be resolved and to be considered within the context of Inland Fisheries Ireland's general management of our Western Lakes as a national asset.

The direction of travel of the current plan is incredible, when one considers the very fundamental information contained not only in Appendix F (e.g. section 10.4.1 & 10.4.1.1 regarding the lack of response of trout stocks to pike removal), but in the scientific strides made by the Research Division of Inland Fisheries Ireland and by external researchers such as Dr. Pedreschi, over the past 10 years.

The current 'Long Term Management Plan for the Western Lakes' appears to sit 'out of step' with all current scientific knowledge and findings, which lean toward taking a more precautionary approach to our fisheries ecologies and therefore to their management, rather than the apparent over-reach that appears to exist within the proposed plan, particularly regarding stock management and the removal of existing pike and coarse fish bye-laws.

#### Section 3.5 - Proposed Management Plan – Submission Item:

1) This submission suggests that certain Actions in the plan over-reach such as those related to pike and coarse fish, particularly in any consideration given to the removal of existing conservation bye-laws relating to those species, and therefore a detailed explanation outlining the scientific basis, justification and expected outcome for the ecology of the Western Lakes of such Actions based upon existing scientific research is requested, and should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this, or any future management plan.

### 3.6 STRATEGIC ENVIRONMENTAL ASSESSMENT - NATURA IMPACT STATEMENT & APPROPRIATE ASSESSMENT

A Strategic Environmental Assessment is mandatory for plans/programmes which are prepared for fisheries or that have been determined to require an assessment under the Habitats Directive (See Directive 2001/42/EC).

Appropriate Assessment (AA) is an impact assessment process that fits within the decision-making framework and tests of Articles 6(3) and 6(4) of the Habitats Directive (See Directive 92/43/EEC).

This submission to Inland Fisheries Ireland regarding their application of the SEA Directive and the Habitats Directive expresses concern that the each of the seven High Level Objectives of the 'Long Term Management Plan for the Western Lakes' inter-alia the High-Level 'Actions' proposed in the plan, will not undergo Appropriate Assessment at High-Level.

This submission proposes that each of the High-Level Objectives and Actions undergo a full Appropriate Assessment by independent consultants. There is a fundamental concern expressed by this submission that the Appropriate Assessment Stage 1 Screening undertaken by INVAS Biosecurity Ltd. concludes that *"the proposed Long-term Management Plan for the Great Western Lakes is likely to contribute to the maintenance or restoration of the favourable conservation condition of habitats and species within Natura 2000 sites"*, without establishing how this conclusion was reached or what peer-reviewed scientific research INVAS Biosecurity Ltd. reviewed, in order to reach the conclusion.

It is considered here that a pre-requisite for examining the implementation of any plan in the context of EU Directives should fundamentally have scientific evidence at its core, and in this instance should additionally question if the plan aligns with Inland Fisheries Ireland's own Corporate Plan (2021-2025), particularly Action 2.3 of HLO 02 i.e. to *"Develop fishery management plans in light of best evidence-based research and modelling available"*.

It is the considered position of this submission that the Stage 1 Screening by INVAS Biosecurity Ltd. does not engage the fundamental application of scientific research, particularly related to the artificial manipulation of fish stocks inter-alia the management operations applied, and the likely impacts for faunal diversity in the Western Lakes, within the context of its conclusion.

#### Section 3.6 - Proposed Management Plan – Overarching Appropriate Assessment Submission Item:

 It is proposed here that this entire submission and <u>all</u> appendices is given in full, to any <u>current or future</u> <u>consultant or external / internal persons</u> engaged in undertaking Appropriate Assessment Screening, Natura Impact Statements, Stage 2 Appropriate Assessments or Strategic Environmental Assessment Reports - related to the proposed "Long-term Management Plan for the Great Western Lakes", or any future Western Lakes management plan or project, where stock management is a proposed element of the plan or project on any of the Western Lakes.

#### 3.6.1 INVAS BIOSECURITY LTD PROPOSAL FOR PLAN ACTIONS TO PROCEED TO STAGE 2 NATURA IMPACT STATEMENT & APPRORIATE ASSESSMENT

Stage 1 Screening for Appropriate Assessment was undertaken by INVAS Biosecurity Ltd. The report was completed in July 2022. Following a request made to Inland Fisheries Ireland, the AA screening report was subsequently added to the documentation made available to the public as part of this public consultation. The release of the report is welcomed.

#### The Stage 1 Screening for Appropriate Assessment prepared by INVAS Biosecurity Ltd. states the following:

"the potential for adverse impacts on Natura 2000 sites are uncertain. Potential impacts as a result of the proposed Actions include the accidental spread/dispersal of IAS, petrochemical/silt pollution and the disturbance/destruction of protected habitats and species (including, but not limited to, Atlantic Salmon, Freshwater pearl mussel, Lamprey, Otter, White-clawed crayfish)."

"Impacts may occur during or after the implementation of the proposed Actions including the establishment of buffer zones, planting programs for native trees, management of IAS, fish stock management plans and restoration of salmonid habitat".

"Based on the above AA Screening a Natura Impact Statement is required in relation to Actions 2.2, 2.3, 4.1. 5.1, 5.2 and 6.1."

The above comments in the Stage 1 Screening by INVAS Biosecurity Ltd. Indicate that Stage 2 Appropriate Assessment is required for Actions *2.2, 2.3, 4.1. 5.1, 5.2 and 6.1*.

Section 4 of this submission sets out a detailed suite of factors potentially adversely affecting the integrity of the Natura 2000 sites concerned. It is expected, in respect of this submission that each of the factors outlined in Section 4 will be fully and scientifically appraised with the context of completing:

- Any and all Natura Impact Statements
- Any and all Appropriate Assessments
- The Strategic Environmental Assessment Report
## 3.6.2 INLAND FISHERIES IRELAND REVISION OF DECC / INVAS REVIEWED HLO ACTIONS IN PROPOSED PLAN - SUBSEQUENT TO STAGE 1 APPROPRIATE SCREENING

The Angling Consultative Council of Ireland (ACCI) was advised by the DECC during 2021 and early 2022, that the 'Long Term Management Plan for the Western Lakes' was submitted to the DECC by Inland Fisheries Ireland and was being reviewed with feedback subsequently given to Inland Fisheries Ireland. This feedback was to allow Inland Fisheries Ireland to proceed with subsequent stages of consideration, e.g. public consultation etc.

During the ACCI meeting with the DECC and Inland Fisheries Ireland on May 30<sup>th</sup> 2022, ACCI members asked for an update on whether or not, an Appropriate Assessment for the plan would be undertaken, prior to the public consultation stage. Inland Fisheries Ireland advised that an Appropriate Assessment would be undertaken and that the public consultation could be postponed until the Appropriate Assessment was complete. A stage 1 Appropriate Assessment Screening was undertaken by INVAS Biosecurity Ltd. and as such, Inland Fisheries Ireland complied with its stated undertaking and supplied the Appropriate Assessment Stage 1 Screening undertaken by INVAS Biosecurity, dated July 2022.

Subsequent to the Appropriate Assessment Stage 1 Screening report undertaken by INVAS Biosecurity Ltd, Inland Fisheries Ireland issued the draft 'Long Term Management Plan for the Great Western Lakes, dated June 2022 (Ref: IFI/2022/1-4618). The Plan was released for public consultation on 9<sup>th</sup> August 2022, however section 11 (P45-P47) of the draft plan contains a revised suite of Actions, to that contained in the High-Level Objectives originally appraised in the INVAS Report dated July 2022. This presents as a significant cause for concern for a number of reasons as follows:

- a) It appears that Inland Fisheries Ireland has two differing and conflicting sets of 'Actions', both of which are contained in the draft plan released for public consultation (i.e. P4-P6 & P45-47) - Why has Inland Fisheries Ireland prepared two different Plans?
- b) Which of the two Plans was originally reviewed and approved by the DECC and Minister Eamon Ryan?
- c) Who authorised the revisions to the plan reviewed by INVAS Biosecurity Ltd, and on what scientific or other basis were the changes made?
- d) Why was INVAS Biosecurity Ltd not given the revised plan, as it clearly pre-dates the completion of the INVAS Report?
- e) What precise information was given to INVAS Biosecurity Ltd?
- f) Why did Inland Fisheries Ireland not release INVAS Biosecurity Ltd.'s Appropriate Assessment Stage 1 Screening report at the commencement of the public consultation period, per the request at the ACCI meeting of 30<sup>th</sup> May, but instead wait until the report was requested by the public when the public consultation process was underway?

It is deeply concerning that Inland Fisheries Ireland has revised and apparently predetermined a new direction for 'Actions' within the draft Plan, as presented in section 11 of the Plan.

See Appendix H - Comparison of INVAS Biosecurity Ltd. Assessed High Level Objectives & 'Actions' with Inland Fisheries Ireland Revised 'Actions' Contained in Section 11 of the 'Long Term Management Plan for the Western Lakes'.

The revised 'Actions' refer in large part to stock management and to the revision of existing pike and coarse fish bye-laws and therefore contain significant and potentially devastating impacts to the ecology of the western lakes, and to which INVAS Biosecurity Ltd. was not advised of.

In addition, the revisions potentially question the credibility of Inland Fisheries Ireland and the systems and procedures under which the organization is directed and controlled per Inland Fisheries Ireland Corporate Plan 2021-2025, and fundamentally questions compliance with High Level Objective 02, Action 2.3 of the Corporate Plan in relation to how fishery management plans are developed "in light of best evidence-based research and modelling available", particularly to determine strategies and potential outcomes of plans and projects undertaken in Natura 2000 sites.

#### Section 3.6.2 - Proposed Management Plan – Submission Item:

 This submission calls for an immediate investigation into who requested and authorised the revisions to the 'Actions' as per section 11 of the 'Long Term Management Plan for the Western Lakes'; the basis (i.e. scientific or other) for the revisions; why INVAS Biosecurity Ltd. was not given the revised 'Actions' at the Appropriate Assessment Screening Stage and why Inland Fisheries Ireland with-held the Appropriate Assessment Screening Report at the outset of the public consultation process?

## 3.6.3 APPROPRIATE ASSESSMENT GUIDANCE FOR A 'PLAN' OR 'PROJECT' IN NATURA 2000 SITES

In line with the guidance for planning authorities for 'Appropriate Assessment of Plans and Projects in Ireland' (Ref: NPWS, 2009), the Appropriate Assessment (AA) is an impact assessment process that fits within the decision-making framework and tests of Articles 6(3) and 6(4) of the Habitats Directive, and comprises two main elements.

• Firstly, a Natura Impact Statement (NIS) – i.e. a statement of the likely and possible impacts of the plan or project on a Natura 2000 site must be prepared.

This comprises a comprehensive ecological impact assessment of a plan or project; it examines the direct and indirect impacts that the plan or project might have on its own or in combination with other plans and projects, on one or more Natura 2000 sites in view of the sites' conservation objectives.

• Secondly, the competent authority carries out the AA, based on the NIS and any other information it may consider necessary.

The AA process encompasses all of the processes covered by Article 6(3) of the Habitats Directive, i.e. the screening process, the NIS, the AA by the competent authority, and the record of decisions made by the competent authority at each stage of the process, up to the point at which Article 6(4) may come into play following a determination that a plan or project may adversely affect the integrity of a Natura 2000 site.

Case law of the ECJ has established that AA must be *"based on best scientific knowledge in the field"*. Accordingly, the NIS must be prepared by a person or persons with the requisite ecological expertise and experience, supplemented as necessary by additional expertise and experience (e.g. geology, hydrology, civil engineering or planning), and produced in a scientifically complete, professional and objective manner.

The timing of the AA is critical and it must precede the decision to authorise, adopt or proceed with a plan or project and must inform the overall decision made. The NIS and the AA must be completed prior to any decision being made to authorise a plan or project.

It is considered *"entirely unacceptable for a planning authority to approve a plan or project conditioned on the undertaking or completion of surveys, research or data-gathering of relevance in assessing the likely effects"* (NPWS, 2009).

#### Section 3.6.3 - Proposed Management Plan – Submission Item:

1) This submission considers that 'Actions' e.g. 5.2, 5.3, 7.1, 7.2 contained in the 'Long Term Management Plan for the Western Lakes' are not based on the *"best scientific knowledge in the field"* as per ECJ Case Law per NPWS (2009), but are instead "*data-gathering of relevance in assessing the likely effects*" and as such the impacts are uncertain and the Actions should be withdrawn until such a time that scientific research is complete.

### 3.7 TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS'

This section contains a review of the Actions proposed in Inland Fisheries Ireland's 'Long Term Management Plan for the Western Lakes'.

The review is set out in 6no. columns as follows:

- Column 1 IFI High-Level Objective and relevant Action (See Page 45, 46 & 47 of the Plan)
- Column 2 Proposed IFI Action (See Page 45, 46 & 47 of the Plan)
- Column 3 General Submission Comment on IFI Action
- Column 4 Proposed Submission Amendment to IFI Action and/or Additional Proposed Action
- Columns 5 & 6 Start and Finish of Action

TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 1)

01		Stakeholder Engagemen	t		
tion	Proposed IFI Action	General Submission Comment on Action	Proposed Submission Amendment to IFI Action and/or Additional Proposed Action	Start	Finish
1.1	Identify and engage with established catchment groups, trusts and associations to assist with the progression of common catchment management goals.	Stakeholder groups to be expanded to include national angling organisations	Identify and engage with established catchment groups, trusts, national angling organisations and associations to assist with the progression of common catchment management goals	2022	5 Year Review
1.2	Where such groups have not yet been established, engage local communities, stakeholders and relevant authorities in the protection and development of their river catchments through the establishment of more Catchment Management Associations for the Western Lakes.	Include conservation of fish species within the Action	Where such groups have not yet been established, engage local communities, stakeholders and relevant authorities in the protection and development of their river catchments and conservation of fish species, through the establishment of more Catchment Management Associations for the Western Lakes.	2022	5 Year Review
1.3	Enhance communication mechanisms and networks between IFI, catchment groups and relevant authorities.	Proposed action excludes or at least dilutes angler, stakeholder and tourism interest groups input by focusing on input from those within catchment areas. There is no reference to the most important stakeholders - farmers. While recognising the work of local community groups, the fisheries in question are not the sole preserve of those residing in their vicinity or within their catchment areas. The Western Lakes are national assets. Their development and maintenance is funded by all Irish tax payers and therefore input into this plan cannot be prioritised in the way IFI are currently weighting input e.g. Geographical location of information evenings.	Enhance communication mechanisms and networks between IFI, catchment groups, farming organisations, national species representative bodies, anglers from outside immediate catchment areas, Tourism Ireland and relevant authorities.	2022	Ongoing

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TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 2)

	Finish	TBC	5 Year Review	TBC
	Start	Started	Started	ТВС
sity	Proposed Submission Amendment to IFI Action and/or Additional Proposed Action	N/A	N/A	N/A
Climate Action & Biodiver	General Submission Comment on Action	Agreed	lmpact Uncertain. Subject to 'Natura Impact Statement' (NIS) and Full 'Appropriate Assessment' (AA) - Ref: SEA Scoping' & 'AA Screening' Reports.	lmpact Uncertain. Subject to 'Natura Impact Statement' (NIS) and Full 'Appropriate Assessment' (AA) - Ref: SEA Scoping' & 'AA Screening' Reports.
	Proposed IFI Action	Identify manageable factors which will contribute to the climate resilience of sensitive habitats and species.	Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient and sediment run-off.	Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity.
HLO 2	Action	2.1	2.2	2.3

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HLO 3		Water Quality			
Action	Proposed IFI Action	General Submission Comment on Action	Proposed Submission Amendment to IFI Action and/or Additional Proposed Action	Start	Finish
3.1	Enhance the capacity of IFI to detect and enforce water quality offences by increasing the number of fisheries environmental Officers working in the catchment areas of the Western lakes.	Public sector funding for staff through the DECC may not provide for additional resources, therefore redeployment of existing staff resources may be more appropriate e.g. redeploy staff presently engaged in stock management. E.g. Cessation of stock management on Lough Ennell showed that a change of focus onto water quality and stream enhancement resulted in an improvement in brown trout stocks.	Enhance the capacity of IFI to detect, and enforce water quality and environmental offences on the Western Lakes primarily through: 1) retraining and upskilling of existing staff, and 2) by increasing environmental officer numbers, if funding becomes available.	2022	5 Year Review
3.2	Enhance the current statutory powers of Inland Fisheries Ireland by authorising officers to enforce the relevant provisions of the Habitat Regulations.	Inspection and enforcement of actions within the IFI plan with regard to oversight of their known or uncertain impact on SAC'S & SPA'S are more appropriately a matter for the National Parks and Wildlife Service (NPWS).	Provide an annual reporting mechanism relevant to the plan, directly to the NPWS based upon the NIS and AA prepared for the plan.	2022	Ongoing
3.3	Continue to improve and enhance working relationships with key environmental authorities in the western lake catchments so that information is shared effectively and increased efficiencies, with regard to environmental enforcement, are achieved.	Agreed	N/A	Started	5 Year Review
3.4 (NEW)	Not Currently Considered	There is a need within this Plan to address water quality issues associated with nutrient inputs e.g. such as excessive nutrient loading appearing on Lough Corrib and Lough Carra.	Provide information and assistance with the designation of nutrient sensitive catchments and areas of action for each Western Lake.	TBC	TBC

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TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 3 CONTINUED)

1BC	10 Year Review	Link to WFD
TBC	2023	1BC
Engage with Mayo Countly Council and the project partners of the EU financed LIFE Project, Lough Carra Life to include specific consultation with catchment management groups, with the sole purpose of building a suite of comparative Agri-environmental and climate measures options for each of the Western Lakes, based on the learnings of the LIFE Project.	Engage with EPA to seek elevation of Lough's Corrib, Conn, Cullin, Sheelin, Arrow, Carra & Mask to 'Priority Site' status to increase frequency within the Water Framework Directive of operational and surveillance programmes for physio-chemical, hydro morphological & biological quality elements on Lough's Corrib, Conn, Cullin, Sheelin, Arrow, Carra & Mask to reflect and assist upcoming research into fish stock dynamics.	Provide an 'Adaptive Management Programme' to scientifically research the link between water quality improvements and fish species responses in the Western Lakes and secure specific funding from DECC for enhanced ecological testing and monitoring to facilitate the programme.
HLO 3 as a primary requisite for salmonids fails to deliver an adequate suite of actions to adequately address the water quality issues facing the western lakes e.g. ongoing algae blooms and precise sources of same on Lough Corrib.	Evidence establishing the need for more focused attention to water quality and the reasons for it's deterioration over time, are amplified by the recent EU financed LIFE Project, Lough Carra Life, in response to a deterioration of Lough Carra that has reached a point that is unaligned with the importance IFI place on the Western Lakes group.	Water quality decline is linked to fish species density (e.g. Salmonids and Coarse Fish) and is a significant driver of ecological changes in the Western Lakes. Lough Sheelin in particular, is an example of how water quality has shaped species density of salmonids and coarse fish over the past 4 decades. The proposed plan embraces the concept of 'Adaptive Management', however it does not define how it will monitor and asses the outcome of water quality improvement or the water quality parameters that it will link to the environmental improvement of the Natura 2000 sites and hence, the improvement of salmonid stocks. The sustainability of future salmonid stocks relies upon pristine water quality as a prerequisite and as such should be the primary management focus of the long term plan for the Western Lakes.
Not Currently Considered	Not Currently Considered	Not Currently Considered
3.5 (NEW)	3.6 (NEW)	3.7 (NEW)

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TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 4 CONTINUED)

					1
4.4	Encourage relevant stakeholder groups to participate in the management of invasive species.	Stakeholder groups are primarily untrained and very likely will not possess adequate public, personal or employers liability insurance to satisfy public sector requirements, nor will stakeholders likely be capable of indemnifying IFI or the DECC in the event of an accident during the performance of such participation. With regard to fish species only, the act of an IFI Action that seeks to encourage one stakeholder to actively kill the fish species that another stakeholder typically releases alive as part of their angling philosophy is deeply concerning and promotes division between angling groups and as such is unwelcome in today's society.	Management of species deemed to be invasive following review of evidence-based management, to be undertaken directly by IFI. Section 59 authorisations by Inland Fisheries Ireland to angling clubs / individuals to cease immediately.	2023 TBC	TBC
4.5	Enhance legislation and increase penalties for the transfer of live fish	Previous DECC comment stated that penalties were adequate. Note: This is an enforcement and education issue with regard to invasive species. IFI has presented no evidence that the emergence of new species in new waterways are linked directly to anthropogenic introduction. Other transfer modes e.g. birds are not adequately researched presently by IFI in a rapidly changing climate / environment.	Seek external advice on resources and available options to improve general fisheries laws enforcement and present suite of options to DECC for review.	2023	5 Year Review
4.6 (NEW)	Not Currently Considered	This plan does not provide specific biosecurity protection measures in action 4.3 for angling or pleasure craft to safely enter and depart from the Western Lakes.	Maintain facilities for angling tourism to the Western Lakes, by installing biosecurity washing stations at all public access entry points on the Western Lakes.	TBC	TBC

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TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 5)

5 OTH		Stock Management			
Action	Proposed IFI Action	General Submission Comment on Action	Proposed Submission Amendment to IFI Action and/or Additional Proposed Action	Start	Finish
5.1	Produce stock management plans annually, to reduce impacts on salmonids from other fish populations.	<ol> <li>The Impact of Actions 5.1 &amp; 5.2 are Uncertain. and subject to 'Natura Impact Statement' (NIS) and Full 'Appropriate Assessment' (AA) - Ref: SEA Scoping' &amp; 'AA Screening' Reports.</li> <li>IFI Have not provided definitive scientific evidence to curnor trock management. Abdoc. IEI actions muct</li> </ol>	Cease stock management for pike on the Western Lakes until completion of research (Ref: IFI/2021/1-4562) and production of peer-reviewed research papers - to provide best practice evidence-based management (EBM) decision making on future management options, if scientifically proven to be necessary, for the Western Lakes.	2023	5-10 years (TBC)
5.2	Adjust stock management plans as population models on each of the lakes are refined.	be scientifically supported. be scientifically supported. 3) IFI have not incorporated existing research into the co-existence of pike and trout in the actions proposed in this plan - See: Mc Cloone et al. (2018). 4) IFI are inappropriately proposing to remove existing protection to a potentially native species (i.e. pike) on	Develop a suite of scientifically supported environment responsive multi-species population modelling options to DECC for each Western Lake, following completion of research (Ref: IFI/2021/1-4562) and production of peer-reviewed research papers.	2023	5-10 years (TBC)
5.3	Enable local stakeholder groups to contribute to stock management and research programmes through a revision of relevant bye-laws	the Western Lakes - See: Pedreschi et al. (2013). 5) IFI historical records regarding the colonisation of pike on the Western Lakes e.g. Lough Corrib are inconclusive - See IPS correspondence to IFI CEO (2022) .	Retain existing pike and coarse fish bye-laws pending completion of definitive scientific evidence of pike predation impact on trout and coarse fish abundance and completion of scientific research into population modelling.	2023	(TBC)
5.4	Develop risk matrix for salmonids based on physical characteristics of each waterbody and the implications of these for predation.	Agreed with added comment regarding bottlenecks and avian and mink predators	Develop risk matrix for salmonids (Salmo salar) based on physical characteristics of each waterbody bottleneck and the implications of these for predation by various fish & avian predators and by mink during the peak run of Annex ii salmon smolts during Spring.	2022	2023

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TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 5 CONTINUED)

Indefinite			
2022			
Confine Gill Net operations on the Western Lakes to Water Framework Directive and IFI Research Department Fish Stock Surveys only - Note: Include additional IAP Protocols for Lough Corrib to prevent IAP Spread.			
<ol> <li>Gillnets for use in stock management (i.e. outside of stock surveys e.g. WFD) are generally opposed by all angling disciplines including a majority of trout anglers - See Curtis, John. (2018).</li> <li>The Impact of gillnets on Annex ii species 'Otter' deserves particular attention in a 'Natura Impact Statement' (NIS) and Full 'Appropriate Assessment' (AA) as during monthly undertaken stock management; gillnets are stretched out over hundreds of metres of shoreline within 80m of shore. This fundamentally contravenes the conservation objectives for Otters e.g. foraging and commuting and acts as potential disturbance of this protected species - See - NPWS Conservation Objectives for Site CO000297.</li> </ol>	3) Gillnets for stock management are set in littoral zones of the Western Lakes and potentially act as a transfer mode for invasive weed within SAC'S (i.e. Natura 2000 sites) e.g. L. Major, as the removal of weed requires considerable effort - See Morrisey et al.(2020) - In addition gillnetting has historically taken place in many of the bays now containing L. Major, therefore gillnetting may be directly responsible for the spread of invasive weed into bays around Lough Corrib.		
1) Gi of st of st all ai angle 2) Th dese State (AA) hunc This obje obje obje obje acts See- See- See- See- COO COO COO COO COO COO COO COO COO CO			
5.5 (NEW)			

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TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 5 CONTINUED)

	5-10 years (TBC)		
	2023		
	Introduce moratorium on the killing of wild brown trout by individual anglers and during angling competitions until completion of research (Ref: IFI/2021/1-4562 to assess/ achieve a stock baseline in conjunction with a stock management moratorium.		
<ol> <li>In relation to wild brown trout stocks both pleasure angling and competition angling are cited as a having a significant negative impact where fish are killed for consumption or competition See: Mc Cloone et al. (2018).</li> </ol>	2) IFI suggest wild brown trout stocks in the named fisheries are "at significant risk". IFI continue to market fisheries such as L. Corrib as the best wild brown trout fisheries in the world. Inviting such angling pressure on a resource that is (as stated by IFI) of primarily conservation and not economic concern is also "a significant risk".	3) Introduce moratorium on trout killing. Post moratorium any angler wishing to take a fish of any species should be subject to a charge within the framework of a tagging scheme similar to that currently employed for Salmon angling. All revenues generated should be ringfenced for development works on the related fisheries.	
<ul> <li>1) 1</li> <li>10</li> <li>10</li> <li>10</li> <li>11</li> <li>11</li> <li>11</li> <li>12</li> <li>13</li> <li>14</li> <li>14</li> <li>15</li> <li>16</li> <li>17</li> <li>17</li> <li>18</li> <li>19</li> <li>10</li> <li>10</li></ul>			
	5.6 (NEW)		

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TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 6)

9 OTH		Habitat Restoration			
Action	Proposed IFI Action	General Submission Comment on Action	Proposed Submission Amendment to IFI Action and/or Additional Proposed Action	Start	Finish
6.1	Address the salmonid habitat deficits in the western lakes catchments through 3 targeted restoration projects per catchment per year.	Note: Impact Uncertain. Subject to 'Natura Impact Statement' (NIS) and Full 'Appropriate Assessment' (AA) - Ref: SEA Scoping' & 'AA Screening' Reports. The target of '3' restoration projects does not provide sufficient information on the total restoration required on each of the Western Lakes to assess the viability of this target as a contribution to the Natura 2000 site.	Produce a risk based catchment management report, fully considerate of the NIS and Full AA, for all catchments in each of the Western Lakes and based on current scientific data - Report to include designation of nutrient sensitive catchments and a 5-year proposed programme of restoration projects for years 2023 to 2028 to be undertaken by IFI and/or OPW.	2023	5 Year Review
6.2	Streamline administrative processes to bring development projects through planning processes to fruition with maximum efficiency.	Agreed	N/A	Started	2022
6.3	Ensure that all relevant environmental protection processes are in place to avoid damage to other sensitive species and habitats.	Agreed	N/A	Ongoing	Ongoing
6.4	Not Currently Considered	IFI are proposing to introduce wide planted buffer zones along the streams and rivers feeding the Western Lakes to offset against climate change. There is no evidence to suggest the extent of work required, the potential cost, or the planned timeline for completion.	Produce a risk based catchment management report using all existing data, detailing all streams and rivers, length, width, any land take required, projected costs and timeline for completion of climate change buffer zones for each of the Western Lakes.	2023	2023

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TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 7)

-07		Research			
tion	Proposed IFI Action	General Submission Comment on Action	Proposed Submission Amendment to IFI Action and/or Additional Proposed Action	Start	Finish
1.1	Develop new and refine existing fish stock monitoring programmes (e.g. WFD) to provide the necessary data for specific population models for the western lakes.	Agreed - IFI to provide clarification on what scientific parameters are required to be met by "Developing new and refining existing fish stock monitoring programmes" and confirm the timeline for having a new monitoring protocol in place.	Develop new and refine existing fish stock monitoring programmes (e.g. WFD) to meet new parameters as advised by the IFI Research Division for commencement in Summer 2023 - to provide the necessary data for specific population models for the western lakes.	2022	2023
7.2	Use all available sources of data incl. Stock management and angling returns to feed into population models for the western lakes.	Note: IFI proposed Action 5.1 Impact Uncertain. Subject to 'Natura Impact Statement' (NIS) and Full 'Appropriate Assessment' (AA) - Ref: SEA Scoping' & 'AA Screening' Reports. Per proposed amended Action 5.1, stock management for pike on the Western Lakes to cease for a period of minimum 10 years to provide for the completion of scientific research into population dynamics and models, dietary changes and environmental & water quality levers upon fish stocks.	Investigate and develop a Mobile APP for reporting catch details by all angling disciplines for all species in the western lakes to feed into population models for the Western Lakes.	TBC	TBC
7.3	Continue to develop climate models under current research programmes (CCMP) to improve resilience in catchments and species.	Agreed	N/A	Started	Ongoing

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TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 7 CONTINUED)

4-Year Study + Peer review	HBC L
Immediate	HBC TBC
Complete the full research proposal contained in Inland Fisheries Ireland Research Division document IFI/2021/1- 4562 - Continued Long Term Studies for Lough's Corrib, Mask, Carra.	Secure specific DECC funding and commence a programme of scientific research specifically designed to determine the colonisation timeline of the Western Lakes by Pike & Perch.
Inland Fisheries Ireland's Research Division have proposed additional research on the Western Lakes to progress the research of McLoone et al., 2018. The Research Division state that the research will provide "Important additional knowledge of predator-prey and competitive interactions will inform full development of a size-based mathematical model of the lake fish community". The Research Division state that "this kind of model is used globally to support best practice Management Strategy Evaluation (MSE) that can support managers by exploring the likely impact of candidate fisheries management actions". The proposed study will take place over 4 years at the total cost of $\pounds 1, 371, 536$ .	The IFI proposed plan fails to consider the possibility that pike on the Western Lakes are linked to a Irrish strain that is considered to be significantly genetically depauperate and considerably divergent from British and European sites examined and are linked to a scientifically researched genetic lineage of naturally colonised Irish pike, extending to a time period of 4000-8000 years ago - See Pedreschi et al. (2014). Inland Fisheries Ireland has not progressed it's scientific knowledge of pike and other species e.g. perch in the Western Lakes group since the scientific research undertaken as presented in Pedreschi (2014). Considered here that the proposed plan seeks to induce a loss of biodiversity in the Western Lakes by removing a potentially native species i.e. Pike. On the basis of the precautionary principle, the management of pike should cease until further and definitive scientific evidence is obtained to elucidate the colonisation of the Western Lakes by Pike.
Not Currently Considered	Not Currently Considered
7.4 (NEW)	7.5 (NEW)

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TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 7 CONTINUED)

ЦВС	TBC	
TBC	TBC	
Conduct a research programme to assess the predation and competition impact from artificially increasing brown trout stocks, on Annex ii Salmon (Salmo Salary) in spawning and nursery streams, in catchments of Lough's Conn, Cullin & Corrib.	Conduct a research programme to assess the dietary impact on Red Listed Mayfly species from artificially increasing brown trout stocks.	
The Western Lakes Long Term Management Plan has been developed primarily on the basis that brown rrout are managed preferentially, despite brown trout peing the most widespread freshwater fish species in reland, are under no threat of extinction and may optentially exert a significant negative impact on species protected under Annex II of the European Habitats Directive i.e. Salmon (Smolts and juvenile ish). The Impact of trout upon these species are uncertain and subject to 'Natura Impact Statement' (NIS) and cull 'Appropriate Assessment' (AA).	The Western Lakes Long Term Management Plan has been developed primarily on the basis that brown crout are managed preferentially, despite brown trout being the most widespread freshwater fish species in reland, are under no threat of extinction and may otentially exert a significant negative impact on Red Listed Mayfly species i.e. (Baetis atrebatinus (Dark Olivel), Procloeon bifidum (Pale Evening Dun) and Ageronia fuscogrisea (Brown May Dun). The Impact of trout upon these species are uncertain and subject to 'Natura Impact Statement' (NIS) and cull 'Appropriate Assessment' (AA).	
Not Currently Considered	Not Currently Considered	
7.6 (NEW)	7.7 (NEW)	

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TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS' (HLO 7 CONTINUED)

TBC		
Conduct a research programme on the best available scientific evidence to assess the impact of angling mortality on the conservation of brown trout stocks on each of the Western Lakes and revise brown trout regulations where necessary.		
The Long Term Plan for the Western Lakes Table 3.1 sets out the current angling regulations for brown trout on each of the Western Lakes. Currently, daily allowable bag limits are as follows: - Lough Corrib, Mask, Carra - 4 trout/day exceeding 33cm. - Lough Arrow - 4 trout/day exceeding 30cm. - Lough Sheelin - 2 trout/day exceeding 36cm. - Lough Conn, Cullin - No limit	The best evidence based research and modelling available from IFI indicates: 1) Some reduction in trout fishing mortality may be slightly more beneficial to trout populations, than an increase in pike removals. 2) Some reduction in trout fishing mortality may be	The Impact of the current brown populations in the increase in pike removals. The Impact of the current brown regulations upon the sustainability of the trout population requires investigation and an assessment of the current viability of the trout stock to remain sustainable under current trout regulations.
Not Currently Considered		

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## 4 FACTORS POTENTIALLY ADVERSELY AFFECTING THE INTEGRITY OF THE SITES CONCERNED

This submission considers that the 'Long Term Management Plan for the Western Lakes' has the potential to adversely affect the conservation objectives and overall ecology of the Natura 2000 sites, including their structure and function and as such are considered to have a 'Potentially Significant Effect'.

A number of 'Potentially Significant' environmental effects will also impact upon human health and the landscape.

It is proposed that each of the impact types reviewed in this section including the respective submission items are <u>fully incorporated</u>, and scientifically assessed by Inland Fisheries Ireland and/or any appointed consultants, during the preparation of Natura Impact Statements, Appropriate Assessments and the Environmental Report prepared in respect of the Strategic Environmental Assessment Scoping Report, <u>for this and any future Management Plans</u> <u>considered by Inland Fisheries Ireland</u>.

The impact types on the Natura 2000 sites are deemed to be described as follows:

- Water Quality and Resource;
- Loss of Habitat Area;
- Species Population Density;
- Potential Removal of Native Species;
- Disturbance;
- Population and Human Health;
- Landscape;

#### 4.1 WATER QUALITY AND RESOURCE

There is common consensus among all stakeholders that the improvement and maintenance of excellent water quality through a programme of results led environmental measures on each of the Western Lakes is of immense importance. It is a position which is strengthened by the pressures faced by our lakes and rivers by climate change.

River Basin District Management Plans developed under the Water Framework Directive are a key component of the improvement of the Western Lakes, however where deficiencies exist in those RBD Plans e.g. such as those that failed to predict the scale of the present deterioration of Lough Carra, it is incumbent upon Inland Fisheries Ireland to understand the implications and shortcomings of such plans and to act decisively for change.

Over the past 30 years there appears to be a strong disconnect between Inland Fisheries Ireland's promotion of salmonids and its own ability to affect the imposition of fundamental water quality protection measures on the Western Lakes and thereby prevent the systemic deterioration of water quality, and its impact on salmonids.

The proposed 'Long Term Management Plan for the Western Lakes' is not fundamentally aligned to that common stakeholder consensus that improving and protecting the environment is of paramount importance to salmonids. It instead binds the management of these lakes into the foreseeable future, to uncertain levels of potential economic and ecological damage, by attempting to manipulate fish stocks through culling, as a response mechanism to offset anthropogenically caused environmental stressors. The angling community requires a more scientifically supported approach to the 'Long Term Management Plan for the Western Lakes'.

### 4.1.1 PLAN NOT CLEARLY ALIGNED TO ENVIRONMENTAL ACTIONS – REF: PROGRAMME FOR GOVERNMENT 2020

On review of the most recent copy of the Programme for Government it is of particular note that under the 'Climate and Biodiversity' heading within the overarching 'Balanced Regional Development - Agriculture and Food' heading -Ref: Department of Taoiseach (2020) there is a clear link between Salmonids and Agriculture.

The 'Climate and Biodiversity' heading states that *"farmers are the primary custodians of the rural environment and have a vital role to play in addressing the climate and biodiversity crisis".* 

The programme for government further states that *"We will work with farmers to bring about change on every farm in the country in a practical way, giving them an opportunity to benefit from environmental actions and providing them with options for income generation, through alternative land use options"*.

There is a clear inference from the Programme for Government that the agricultural sector is central to the conservation of salmonids. As angling representative bodies, it is reasonable to expect that the 'Long Term Management Plan for the Western Lakes' would therefore align with Programme for Government and seek to elevate the named waters in the plan, above current EU Directives and Statutory Instruments, by introducing a suite of environmental actions, sampling analysis and compliance conformity, to expressly improve water quality within the Western Lakes for the primary benefit of salmonids.

A precedent existed for linking environmental quality to waters capable of supporting salmonids. Lough Corrib was afforded this additional support under 'S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations, 1988'. These Regulations prescribed quality standards for salmonid waters and designated the waters to which the regulations would apply, together with the sampling programmes and the methods of analysis and inspection to be used by local authorities to determine compliance with the standards. None of the six remaining waters named in this plan were afforded this designation as waters capable of supporting salmonids.

We believe that the 'Long Term Management Plan for the Western Lakes' fails to address the environmental quality and therefore the ecological sustainability of the respective fisheries for future generations, and instead binds the management of the fisheries to a continued programme of fish removal and artificial stock manipulation. It is particularly egregious that it is intended to pursue a revision to conservation bye-law 809 (2006) and to promote angler participation to cull pike without any scientific assessment of either its efficacy or appropriateness.

The net effect of the proposed plan is that the natural balance of stocks of all existing fish species in the Natura 2000 sites will remain unknown and that the results of fish stock surveys, carried out by Inland Fisheries Ireland every 3 years as required under the EU Water Framework Directive, will not reflect the true ecological balances within the respective fisheries.

#### Section 4.1.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

- 1) It is proposed here that the Plan is re-drafted to reflect measures connected <u>specifically</u> to the agricultural sector regarding practices and land use, including measures implied by the Nitrates Directive, Habitats Directive, EU Water Framework Directive, and the Rural Environmental Protection Scheme for such lakes, rivers and tributaries within designated Special Areas of Conservation (SAC's), by introducing a suite of environmental actions, sampling analysis and compliance conformity, to expressly improve the ecology within the waters for the primary benefit of salmonids as implied by the Programme of Government 2020.
- It is proposed here that the Plan is re-drafted to include a full risk analysis of all environmental stressors acting on the Western Lakes to include, but not limited to the following: agriculture, forestry, industry, domestic waste treatment, municipal water and waste treatment, land drainage, water extraction etc.
- 3) It is proposed here that Action 3.1 of the Plan is re-drafted to include for the redeployment of staff engaged in stock management to increased environmental detection and enforcement and that the Action 3.1 include for 1) retraining and upskilling of existing staff, and 2) increasing environmental officer numbers, if funding becomes available.
- 4) It is proposed here that in consideration of submission item.1 of this section, that a new additional Action 3.4 is inserted into the Plan to specifically propose engagement with Mayo County Council and the project partners of the EU financed LIFE Project, Lough Carra Life to include specific consultation with catchment management groups, with the sole purpose of building a suite of comparative Agri-environmental and climate measures options for each of the Western Lakes, based on the learnings of the LIFE Project.
- 5) It is proposed here that a new additional Action 3.6 is inserted into the Plan to specifically engage with EPA to seek elevation of Lough's Corrib, Conn, Cullin, Sheelin, Arrow, Carra & Mask to 'Priority Site' status to increase frequency within the Water Framework Directive of operational and surveillance programmes for physio-chemical, hydromorphological & biological quality elements on Lough's Corrib, Conn, Cullin, Sheelin, Arrow, Carra & Mask to reflect and assist upcoming research into fish stock dynamics.
- 6) It is proposed here that a new additional Action 3.7 is inserted into the Plan to specifically provide an 'Adaptive Management Programme' to scientifically research the link between water quality improvements and fish species responses in the Western Lakes and secure specific funding from DECC for enhanced ecological testing and monitoring to facilitate the programme.

## 4.1.2 PAST & CURRENT ENVIRONMENTAL ISSUES – REQUIREMENT TO RE-FOCUS PLAN ONTO ENVIRONMENTAL ISSUES

Champ et al. (2009) reviewed the use of fish as a management tool in the context of the EU Water Framework Directive. They commented that with regard to reference conditions for Irish lakes that agricultural soils were nutrient deficient in 1950. A programme of soil fertilization had commenced around that time. In addition, major land drainage schemes commenced following the Arterial Drainage Act 1945. Since 1950, most of Irelands forest area has become established.

In the context of the current Plan, it is important to place an appropriate weighting in respect of environmental pressures on the salmonid species, as it is suggested here that to manage fish stocks in response to environmental pressures potentially masks the ecological drivers in our lakes and undermines the sustainability of our Natura 2000 sites.

A non-exhaustive list of notable consequences of environmental pressures is outlined for some of the named lakes in the Plan. Further supporting documents can be referenced if required.

#### Lough Sheelin

- Bloom-forming species of algae were present in Lough Sheelin in 1952. The lake was noted as tentatively classified as eutrophic with the water remaining clear until extensive growths of filamentous green algae appeared in some bays (Champ, 1979);
- Phosphorus originating from intensive agricultural developments has caused progressive enrichment of Lough Sheelin since the early 1970s (Kelly et al. 2015);
- Recent data (2006 to 2014) indicates that there has been no improvement in the nutrient loadings to the lake (Kelly et al. 2015);
- Wild trout stock supplemented by farm reared trout commencing circa 1978 (Data from Freedom of Information). Farmed trout used for providing salmonid angling opportunity;

#### Lough Conn

- Arctic char considered extinct in Lough Conn following nutrient enrichment;
- Phosphorous loading exceeded 20000 kg P/annum from agricultural according to the Irish Char Conservation Group Ltd. This exceeded the phosphorous loading of a combination of all other municipal and forestry sources according to the groups reports entitled "Lough Conn – A Lake in Trouble" and "The Lough Conn Char – Now Extinct!";
- Lough's Conn & Cullin experienced a significant decline in trout stocks in the 1990's due to pollution and increased nutrient enrichment;

#### Lough Corrib

- Arctic char considered extinct in Lough Corrib following nutrient enrichment;
- Annex II species Freshwater Pearl Mussel, in the Owenriff river discharging into Lough Corrib has suffered losses to juvenile mussels with the habitat recognised as unsuitable for the recruitment of mussels by the National Parks and Wildlife Service, due to sedimentation and enrichment (NPWS, 2017). It is notable that Inland Fisheries Ireland had an alternative view of the ecological quality of the catchment in 2017 and found that *"there are little or no major anthropogenic pressures in the catchment"* (IFI 2018);
- Filamentous algae abundances in the Owenriff river discharging into Lough Corrib have been recorded at 20 times in excess of the recommended levels in the Owenriff river (NPWS, 2017);
- Environmental Deterioration leads Lough Corrib Angling Federation to commission a report entitled 'Lough Corrib – A cause for Concern' following independent water quality sampling in 1995. This is despite the protection afforded to Lough Corrib by the 'Quality of Salmonid Waters Regulation - S.I. No. 293/1988.

'The Irish Times' newspaper edition of 10<sup>th</sup> January 1997 commented on the content of the report that Lands adjoining important lakes in the region should be set aside in the interests of environmental protection. To ensure long term protection, the entire system should be assigned National Park status or designated and protected by *"enforceable and enforced regulations"*. Ref: https://www.irishtimes.com/news/action-sought-to-save-corrib-fishery-1.20412

- Pollution events continue to affect Lough Corrib A recent report in the Irish Farmers Journal regarding a pollution incident in 2020 stated "Galway farm fined over €2,000 following effluent pollution of river" and that the "incident led to significant damage to the water quality of the Lough Corrib catchment" Ref: <a href="https://www.farmersjournal.ie/galway-farm-fined-over-2-000-following-effluent-pollution-of-river-628704">https://www.farmersjournal.ie/galway-farm-fined-over-2-000-following-effluent-pollution-of-river-628704</a>
- No explanation for Corrib algae An article in the Connacht Tribune dated 2<sup>nd</sup> July 2020 stated that environmental scientist Roderick O' Sullivan had stated *"Oughterard Bay is currently a disgraceful sight – mats of sewage sludge cover the surface; islands of green scum float listlessly with the wind and both shore and pier are festooned with rotting and decaying beds of algae".* The article stated that Inland Fisheries Ireland and the EPA *"could not identify the source of the algal bloom"* Ref: <u>https://connachttribune.ie/no-explanation-for-corrib-algae-154/</u>

#### Lough Carra

• "The Irish Times" newspaper edition of 7<sup>th</sup> June 2018 reported that "Time is running out for Lough Carra".

The report commented that *"the marl has been masking the fact that there are too many nutrients entering the lake, from fertiliser, slurry run-off and other sources"*. The report commented that Lough Carra was one of the few lakes in Ireland to be considered *"high"* status under the Water Framework Directive and has since been revised to *"good"* and that its risk status was under *"review"*. There were suggestions in the report that the EPA standardised monitoring system didn't consider aspects of Lough Carra's ecology. Ref: <u>https://www.irishtimes.com/news/science/time-is-running-out-for-lough-carra-1.3513993</u>

• Eco Eye on RTE television report that Lough Carra is reaching an environmental 'tipping point".

The Eco Eye report was highlighted by the "Western People" newspaper edition of 13<sup>th</sup> January 2021 where it was commented that Ecologist Dr. Cilian Roden said that without a dramatic reversal *"it is inevitable we will lose this lake sometime in the next 20 years"* Ref: <u>https://westernpeople.ie/2021/01/13/scientists-warn-pollution-will-destroy-mayo-lake-within-20-years/</u>

#### Section 4.1.2 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

- It is proposed here that there is a considerable risk for environmental factors to continue adversely impacting on the environmental quality of the Natura 2000 sites and their salmonid species, and in this regard the consultant appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) should assess if the Plan adequately addresses this risk within the Actions proposed.
- 2) It is proposed here that Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, 7.2 which currently include measures associated with "stock management" on each of Western Lakes, are removed from the Plan and instead replaced with an appropriate suite of enforceable regulations designed to improve, protect and monitor the water environment in each of the Natura 2000 sites in response to water quality improvement.

## 4.1.3 EVIDENCE OF STOCK MANAGEMENT POTENTIALLY UNDERMINING THE EU WATER FRAMEWORK DIRECTIVE

Minister Eamon Ryan, Minister for the Environment, Climate and Communications is aware that stock management has been used by Inland Fisheries Ireland to potentially offset the effects of pollution on fish species. The measurement of fish stocks however, is key to assessing the ecological status of the biological quality elements of all European surface water bodies under the EU Water Framework Directive. The three biological elements to be included for fish in lakes are species composition, abundance and age structure (Kelly et al. 2012). It could be argued that **"stock management plans"** artificially manipulate fish species composition and abundance therefore may potentially undermine the integrity of the EU Water Framework Directive in these individual surface waters.

As Green Party Leader, Minister Ryan is uniquely placed to address this matter and to place the focus directly on the environmental pollution issues that have affected salmonids for decades and which are relevant in the context of the EU Water Framework Directive, and to remove the stock management focus that has been allowed to mask the problems facing the sustainability of salmonids in our surface water bodies and Natura 2000 sites.

Minister Ryan received personal communication directly from the Chief Executive Officer of the Shannon Regional Fisheries Board (now Inland Fisheries Ireland), on 17<sup>th</sup> July 2003 in regard to Lough Sheelin where it was stated that:

"Dr. Martin O' Grady, Senior Research Officer with the Central Fisheries Board has stated that Lough Sheelin is "a unique ecological resource". Unfortunately, the pollution of this lake over 30 years, has caused a serious imbalance in fish populations and it is in an effort to control this imbalance that the board removes fish".

There is a reasonable concern that stock management, is presently, and will continue to be used by Inland Fisheries Ireland as a management tool to assist Ireland's compliance with the ecological status component of our lakes under the EU Water Framework Directive, by:

- Artificially seeking to improve the abundance of native species by systematically reducing the abundance of non-native species;
- Using stock management to achieve a standard of "Good Water Quality" and thereby avoid EU fines at the conclusion of the current derogation periods applicable to the EU Water Framework Directive.

It is considered reasonable to conclude that Action's 4.1, 4.4, 5.1, 5.2, 5.3, 5.4 & 7.2 within the Plan that rely on stock management are not is the best interest of our surface water bodies and the greater Natura 2000 designation of the sites, as there is considerable risk of "stock management plans" being used to intensify fish removal as an offset mechanism, in response to ongoing deteriorating environmental conditions in the Natura 2000 sites.

#### Section 4.1.3 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

- It is proposed here that the consultant appointed to prepare the 'Natura Impact Statement' and the 'Appropriate Assessment' for the Plan considers the implications for the integrity of the EU Water Framework Directive in Ireland, of artificially manipulating fish stocks within the Natura 2000 sites and the uncertainty this action places on the three biological elements i.e. fish composition, abundance and age structure, subsequently to be used as indicators in Ireland's EU obligation to achieve a standard of "Good Water Quality" with regard to the named lakes.
- 2) It is proposed here that Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, 7.2 which currently include measures associated with "stock management" on each of Western Lakes, are removed from the Plan and instead replaced with an appropriate suite of enforceable regulations designed to improve, protect and monitor the water environment in each of the Natura 2000 sites in response to water quality improvement.
- 3) It is proposed that all future fish stock surveys carried out to satisfy Ireland's obligation with regard to the EU Water Framework Directive on the Western Lakes, are carried out based upon establishing the true impact of the prevailing water quality ecological drivers within the Lakes.

#### 4.2 LOSS OF HABITAT AREA

It is considered here that a specific component the 'Long Term Management Plan for the Western Lakes' relating to the inclusion of brown trout (salmo trutta) in the Plan is not directly connected with or necessary to the management of the Special Areas of Conservation, and that there may be adverse implications of increasing the populations of brown trout through direct habitat competition for food and space in the spawning and nursery streams used by both brown trout (salmo trutta) and Annex II species salmon (salmo salar).

### 4.2.1 DESIGNATION OF SITES PREFERENTIALLY FOR NON-THREATENED SALMONID BROWN TROUT (SALMO TRUTTA)

Brown trout are the most widespread fish in Ireland and are found in practically every river, stream and lake in the country. <a href="https://www.fisheriesireland.ie/fish-species/brown-trout.html">https://www.fisheriesireland.ie/fish-species/brown-trout.html</a>

It is considered here that brown trout are not a threatened species. The designation of lakes in Natura 2000 sites to be managed preferentially as wild brown trout fisheries as has been the case historically, now potentially contravenes the EU Habitats Directive. It is clear that if the waters, comprising approximately 27% of the total surface area of lakes within the Irish State are to be managed preferentially for the benefit of one species, i.e. brown trout inter-alia all of the management tools that this entails, the State will be in substantial breach of its obligations under the Habitats Directive to manage such waters in accordance with the needs of several species expressly specified in the Annexes to the Directive including but not limited to Otter, Common Frog, European Eel, several species of mayfly (ephemeroptera), Lamprey, Atlantic Salmon, Irish Freshwater Pearl Mussel and White Clawed Crayfish.

It is noted that a number of these Natura 2000 sites currently receive artificial stock enhancement in the form of farmed trout. As such the proposed Plan also seeks to elevate the protection of these unnatural stocked trout over native and naturalised fish species. This may have an adverse impact on the integrity of Natura 2000 sites.

#### Section 4.2.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

 It is proposed here that brown trout (salmo trutta) are not directly connected with, or necessary to the management of the Special Areas of Conservation, with potential adverse impact on Annex II species salmon (salmo salar), and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'. 2) It is proposed here that farmed trout are not directly connected with or necessary to the management of the Special Areas of Conservation with potential adverse impact on Annex II species salmon (salmo salar), native or naturalised species and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

# 4.2.2 LOSS OF ANNEX: II, V SALMON SPAWNING & NURSERY HABITAT – RESPONSE TO INCREASE IN BROWN TROUT

Brown trout (salmo trutta) and Annex ii species salmon (salmo salar) often share spawning and nursery habitat in the tributaries of the waters named in the proposed 'Long Term Management Plan for the Western Lakes'.

The proposed Plan seeks to conserve salmonids, though by expressly providing for 'stock management plans' the inference is that the focus of the Plan will be principally to increase the brown trout population in the Natura 2000 sites by removing any fish that might be a predator or competitor of brown trout. However, it is considered in this submission that the Plan may adversely impact on an Annex ii species i.e. salmon, by artificially increasing trout populations beyond the capability of the available habitat for salmonid species generally.

It is considered here that there may be unintended adverse impacts following any potential increase in the trout (salmo trutta) population by increasing the densities of salmonids in spawning and nursery habitats above their natural levels. Inland Fisheries Ireland state that brown trout are territorial, competing for the best feeding location in their river" Ref: <a href="https://www.fisheriesireland.ie/fish-species/brown-trout.html#ecology-life-history">https://www.fisheriesireland.ie/fish-species/brown-trout.html#ecology-life-history</a>. Increasing numbers of juvenile trout in a salmon fry habitat may restrict salmon to shallow and fast flowing habitat. It is possible that overall salmon production could be reduced due to salmon being unable to occupy all the available habitat (Hendry & Cragg-Hine, 2003).

In Lough Corrib, population estimates of juvenile salmonids in the Corrib system were assessed in 1980 (Ref: Browne and Gallagher 1981). Lough Corrib is one of the Western Lakes. It was observed in the 1980 population assessment that the survival of salmon in the Cornamona river from 0+ to 1+ was 16% and it was discussed that it was important to have the ideal number of spawning fish and not too many as was suggested appeared to be the case in the Cornamona river. The population assessment further found that 0+ salmon in the Bunowen river were small, and it was suggested that the salmon may be in direct competition with larger 0+ trout. The population assessment did not discuss in detail the modes of competition between salmon and trout. However, it is considered here that it is not unreasonable to suggest that competition for food and space might be a significant factor impacting on the sustainability of salmon populations and that artificially increasing the population of trout may negatively impact on Annex ii species, salmon.

A review of the population estimates for juvenile salmonids i.e. trout and salmon recorded in Browne and Gallagher (1980) and Browne and Gallagher (1981) indicate very striking observations regarding the co-existence of 1+ trout and 1+ salmon. While a correlation is not investigated or implied in either paper, on review of the data sets, there appears to be:

- a considerable reduction or non-capture of 1+ salmon in tributaries where 1+ trout are available;
- a possible adverse impact by 1+ trout on the co-existence and availability of 1+ salmon in nursery / feeding locations;

This would seem to be supported by Inland fisheries Ireland's earlier referred to statement on the territorial nature of brown trout. An important consideration may be that during the study period in circa 1980, an active and ongoing stock management programme for pike was in place by Inland Fisheries Ireland's predecessors, and this in itself may have had implications for salmonid production and species competition.

It is considered here that there may be an adverse impact on the availability of food and therefore the growth rate of salmon in the Special Areas of Conservation (SAC'S) as a consequence of increasing the population of brown trout and in particular larger 1+ or greater brown trout. A reduction in growth rate can have substantial life-history consequences, and capacity to withstand harsh winter conditions, but in the case of sea-migratory salmonids, also for determining life-history tactics, timing of smoltification and time spent at sea (Kaspersson et al. 2013). This may be an important factor as climate change adds additional pressures to salmon stocks within the river environment.

#### Section 4.2.2 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

 It is proposed here that there may be an adverse impact on Annex ii species salmon (salmo salar), directly related to an artificially induced increase in brown trout (salmo trutta) populations through competition for food and space on salmon spawning and nursery habitats in the SAC's and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

#### 4.3 SPECIES POPULATION DENSITY

The proposed 'Long Term Management Plan for the Western Lakes' seeks to conserve salmonids i.e. Annex ii salmon (salmo salar) and brown trout.

It is considered here that the Plan has the potential to adversely impact on the population density of numerous species in Natura 2000 sites, including protected and red-listed species by potentially failing to recognise the following in the preparation of a 'Natura Impact Statement' and 'Appropriate Assessment':

- If the Plan, in consideration of all other potential impacts, is appropriate in determining the requirement for "stock management plans" in the context of reviewing the current conservation limits of Atlantic Salmon in the Special Areas of Conservation;
- If the Plan has appropriately considered the impact on the whole ecology of the lakes, their food webs and predator prey relationships, by including the requirement for "stock management plans" in Natura 2000 sites generally;
- If the Plan has appropriately considered the impact of increasing brown trout populations in particular, on red-listed mayfly species, from the inclusion of "stock management plans" in the Natura 2000 sites, clearly with the objective of increasing brown trout stocks;
- If the Plan has appropriately considered the current and potential impacts of predation on Annex ii species Atlantic Salmon all species such as Brown Trout, Pike, Cormorants inter-alia predator avoidance tactics used by salmon smolts;

## 4.3.1 ANNEX: II, V SALMONID (SALMON) – CURRENT CONSERVATION LIMITS AND WEIGHTING OF PLAN RISKS

In Ireland, the Atlantic salmon population are considered vulnerable due to declines in abundance, reduced survival at sea, habitat loss due to hydroelectric schemes, water quality issues, over-fishing and the potential impact of salmon aquaculture. Ref: <a href="https://www.fisheriesireland.ie/fish-species/atlantic-salmon.html#conservation-legal-status">https://www.fisheriesireland.ie/fish-species/atlantic-salmon.html#conservation-legal-status</a>

As defined in the EU Habitat's Directive, the favourable conservation status of a species is achieved when:

- The population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;

Annex ii species Atlantic Salmon (salmo salar) is the only relevant protected species contained in the 'Long Term Management Plan for the Western Lakes'. It is considered here that the Strategic Environmental Assessment Report; the Natura Impact Statement and the Appropriate Assessment for the Plan should first:

- Consider if each Special Area of Conservation (SAC) is meeting its conservation limit for Atlantic salmon;
- Assess all freshwater adverse impacts on the potential for salmon to meet its conservation limits in the individual Special Areas of Conservation (SAC);
- Provide advice to the DECC in relation to the weighting of the individual impacts on the conservation limits for Atlantic salmon in the individual Special Areas of Conservation (SAC);

#### Section 4.3.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

 It is proposed here that the conservation limits for Atlantic salmon are reviewed in the context of all freshwater adverse impacts and that the brief of the consultant appointed should be extended to consider the weighting of all individual risks to include any risk associated with the Plan, and that this review be included in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

# 4.3.2 IMPACT ON OVERALL LAKE ECOLOGY OF REMOVING OTHER FISH TO INCREASE SALMONIDS (TROUT, SALMO TRUTTA)

The 'Long Term Management Plan for the Western Lakes' seeks to remove fish species to increase the population of salmonids i.e. Annex ii Salmon (salmo salar) and brown trout (salmo trutta).

Salmon (salmo salar) are an existing species in Lakes Corrib, Conn and Cullin only. Brown trout (salmo trutta) is the species to be protected by the Plan in Lough's Sheelin, Mask, Arrow and Carra. Therefore, it is considered here that "stock management plans" are to be undertaken principally for the supposed benefit of brown trout.

The impact of adopting a management assessment and strategy to expressly benefit brown trout became clear on Lough Corrib in 2012. Stock management i.e. pike removal had taken place each year for the previous 16 years. Two major fish stock surveys carried out directly by IFI - one in 1996 and the other in 2012, showed that in 2012, the population of pike had fallen by 48% and that the population of trout had fallen by 21% by the end of the 16-year period. This strongly indicates that the removal of pike is not guaranteed to result in an increase of salmonids.

The intention of the long-term stock management plan that persisted on Lough Corrib between 1996 and 2012, after a period of cessation of stock management from the late 1980's suggests that it is impossible to predict the actual outcome of any stock management plan. This lack of understanding clearly has implications for the entire ecology within the lakes of the respective Natura 2000 sites.

Changing environmental conditions can also influence the ecology within the lakes. Roach populations can expand and contract in response to nutrient enrichment and can impact on food webs. Pike have been found to have changed their dietary habits to prey upon roach in studied lakes. Current research indicates that there was no evidence to support the hypothesis that trout are currently selectively preyed upon in Irish lakes (Mc Cloone et al. 2019). Invasive zebra mussels, now found in most of the lakes have also impacted upon lake ecology. Lough Sheelin has endured considerable environmental pressures over many years. Removing top predators may have unanticipated and potentially negative effects on target fish stocks in systems experiencing multiple anthropogenic pressures (Shephard et al. 2018).

It is considered here that "stock management plans" may adversely impact on the ecology of the lakes and may not result in the expected outcome of improvement to trout within the lakes in the Natura 2000 sites. As such, this matter needs to be assessed within the Appropriate Assessment.

#### Section 4.3.2 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

 It is proposed here that the potential adverse impact on the ecology of the lakes in the Natura 2000 sites of removing fish species as part of "stock management plans" without clear scientific evidence of the functional effectiveness of such plans at the outset, are reviewed by the consultant appointed and that this review be included in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

## 4.3.3 IMPACT OF INCREASED SALMONIDS (TROUT, SALMO TRUTTA) ON RED LISTED MAYFLIES (EPHEMEROPTERA)

Kelly-Quinn & Regan (2012) reviewed the records for 33 species of Irish mayflies (Ephemeroptera) and evaluated their conservation status. The review noted that six species were threatened; two species were near threatened and data on two species was deficient.

A separate search regarding the species in the Natura 2000 sites indicates that Lough Corrib contains three of the species listed by Kelly-Quinn & Regan (2012). These are:

Baetis atrebatinus (Dark Olive) – Endangered

Procloeon bifidum (Pale Evening Dun) – Vulnerable

Kageronia fuscogrisea (Brown May Dun) - Near Threatened

It is known that mayflies are a key component of the diet of salmonid fishes and that anglers replicate various stages of the lifecycle of mayflies to catch trout (salmo trutta).

The 'Long Term Management Plan for the Western Lakes' seeks an increase in the population of trout as part of the objective of the Plan, therefore it is reasonable to suggest that species of mayfly that are endangered and vulnerable are likely to experience an increase in predation pressure from trout, if trout populations rise in response to the Plan.

Brown trout are not endangered, however any potential adverse effect on the mayflies contained in Ireland's red list could have very negative consequences for the survival of the affected species.

#### Section 4.3.3 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

 It is proposed here that there may be an adverse impact on red-listed endangered and vulnerable Mayflies (Ephemeroptera), directly related to an increase in brown trout (salmo trutta) as a consequence of the objectives of the 'Long Term Management Plan for the Western Lakes' and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

#### 4.3.4 LOSS OF ANNEX: II, V SALMON PARR & SMOLTS - TROUT PREDATION ON SALMON

Salmon Watch Ireland (SWI) acknowledge that "Salmon fry are vulnerable to trout and other piscivorous fish within systems and heavy predation may occur". "Parr are affected by predation from certain predator fish including brown trout" Ref: <a href="https://salmonwatchireland.ie/project/predation-of-salmonids/">https://salmonwatchireland.ie/project/predation-of-salmonids/</a>

Trout predation on alevin salmon was discussed by the Director of SWI in an online presentation during the Covid19 pandemic, titled "Where have all the Salmon Gone?" It is important to note here that it was stressed by the presenter, that while predation by trout is a factor, there was no implied suggestion that trout be removed.

The National Parks and Wildlife Service NPWS also acknowledge that trout predation takes place on salmon smolts but state that "little is known of the significance of trout predation on salmon smolts in rivers or lakes" (NPWS 2007). The Ness & Beauly Fisheries Trust in Scotland prepared a document in 2017 after having examined peer reviewed papers and communications relating to trout (salmo trutta) as predators of juvenile salmon. The document discussed conclusions by authors that brown trout of 230-320mm in length were *"serious predators of salmon smolts in Ireland"* and noted brown trout of the same length consumed salmon fry between April and November in Rossshire. The document referenced unpublished data relating to the River Conon attributing a 20% mortality of salmon smolts being partly attributed to predation by brown trout (Ness & Beauly Fisheries Trust, 2017).

The predation of trout on salmon at the various life stages is recognized but clearly not understood in terms of the individual impact of this species on salmon. The implications for introducing any measure under this proposed Plan that seeks to increase or to maximise the stocks of brown trout (Salmo trutta) could potentially have a negative impact on an Annex ii species i.e. Salmon. As such, further negative impacts may extend to the Annex II fresh water pearl mussels which require salmon as part of their life cycle.

It is therefore considered here that as the Plan has the objective of seeking to increase brown trout stocks as one of the salmonid species, this may give rise to significant effects in Natura 2000 sites containing Annex ii Salmon at times where both species are in close proximity i.e. spawning and nursey rivers and streams connected to the named lakes.

#### Section 4.3.4 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

 It is proposed here that there may be an adverse impact on the ecology of the Natura 2000 sites if trout populations are artificially increased in the Special Areas of Conservation (SAC) - by predating to an unknown extent upon Annex ii Salmon at the early life stages and as such, the potential adverse impact on salmon should be considered in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'. 2) It is proposed here that the objective of artificially increasing the stocks of brown trout is removed from the 'Long Term Management Plan for the Western Lakes', instead focusing on the natural fish biomasses responding to water environment improvements, as artificially increasing trout may enhance potential risk from predation on salmon alevins, parr and smolts in the spawning and nursery rivers and streams by an increased brown trout (Salmo trutta) population, which may have an adverse impact on the conservation objectives on the Natura 2000 sites.
# 4.3.5 LOSS OF ANNEX: II, V SALMON PARR & SMOLTS - CORMORANT AND GENERAL BIRD PREDATION ON SALMON

The National Parks and Wildlife Service (2007) stated that predation *"by birds (cormorants, mergansers and goosanders) takes place on salmon eggs, fry and parr"*. NWPS (2007) comment further that *"large numbers of cormorants may congregate in the lower sections of rivers and prey heavily on migrating salmon smolts"*.

Kennedy and Greer (1988) estimated that predation by cormorants on the River Bush in Northern Ireland accounted for losses of 51 – 66 % of the migrating salmon smolt run. NPWS (2007) state that *"large numbers of cormorants are regularly seen on the rivers Slaney, Lackagh, Leannon, Nore and Barrow feeding on juvenile fish including juvenile salmon".* 

Salmon Watch Ireland (SWI) acknowledge that *"avian predation is also a factor with Cormorants, various divers* and Grey Herons particularly evident in nursery areas". It states however that *"predation rates are lower than on* newly emerging fry". Ref: <u>https://salmonwatchireland.ie/project/predation-of-salmonids/</u>

The predation of birds on salmon at the various life stages is clearly recognized. Cormorant numbers in particular are considerable on some fisheries and appear overlooked with regard to their overall predation impact. The losses of up to 66% of migrating smolts on the River Bush indicate the potential adverse impact of cormorants during the smolts runs on the tributaries of the named lakes in the 'Long Term Management Plan for the Western Lakes' could be considerable, which could give rise to significant effects on the Natura 2000 sites.

It is of course not suggested here, that cormorant or other bird populations are managed as part of the 'Long Term Management Plan for the Western Lakes'. However, it is reasonable to suggest that the integrity of the Natura 2000 sites should be assessed with regard to the historic and current bird populations and any significant effects posed by avian predators should be considered in the context of preparing the current Natura Impact Statement and Appropriate Assessment, and within the current Plan.

# Section 4.3.5 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

 It is proposed here that all scientific research available regarding avian predation on Annex ii species Salmon be reviewed to include this potential adverse impact on Annex ii salmon in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

# 4.3.6 LOSS OF ANNEX: II, V SALMON SMOLTS – PIKE PREDATION ON SALMON

Pike have been targeted by "stock management plans" during the smolt migration period more intensely in recent years, however it is important to note that predation is a natural process that has taken place over hundreds and possibly thousands of years in Ireland. The focus on pike appears to have intensified in response to the general collapse of salmon stocks nationally due to factors acting collectively and principally in the marine environment e.g. impact of sea lice on outgoing smolts and returning salmon.

The National Parks and Wildlife Service (2007) state that Pike (Esox lucius L.) are *"known to prey on salmon smolts during the spring period".* Salmon smolts passing through large lakes on their downward migration are *"frequently recorded in pike stomachs in Lough Corrib on the Corrib system and Lough Conn and Cullin on the Moy system"* (NPWS 2007). It is known that migrating smolts can time migration runs during dusk. This is thought to be a predator avoidance tactic, however in instances where obstacles are met (e.g. dams etc.), the migration time can be slowed, leaving the smolts open to further predation.

Mc Cloone et. al (2018) answered some on-going questions related to the dietary preference of pike and pike-trout interactions in lakes in Ireland. Monthly sampling of pike caught by electrofishing with diet studied using gastric lavage, was undertaken on Lough Conn and Lough Derravaragh from August 2016 to July 2017. This method reduced the incidence or food regurgitation often associated with netting. It is noteworthy, that with regard to Lough Conn, pike diet samples were taken from a number of river mouths, including the Deel river - a noted salmon river. Samples were also taken from the Pontoon area where smolts would pass before making their way to the River Moy and onwards to sea. The study found that the %IRI for roach was 34.0 and therefore roach was the most important fish prey item for pike captured in Lough Conn during the study period. Of particular interest was the %IRI for trout was 1.5 and a combination of unidentified remains/salmon had a %IRI of 0.5.

The pike dietary findings suggest that the proportion of unidentified remains/salmon does not appear to reflect the level of predation on smolts that might be inferred by the NPWS. The locations chosen by Mc. Cloone et al. (2018) clearly were intended to present a balanced reflection of pike diet by sampling pike close to smolt migration routes.

The inference made by reviewing the findings of Mc. Cloone et al. (2018) is that the percentage of pike within the population that predate upon smolts may be less than thought. Prior to this, Pedreschi et al (2015) found during dietary SIA dietary studies of Irish pike that there was "a high degree of individual dietary variation within populations". This is a critical point to be observed within the context of reviewing the validity of the stock management element of the 'Long Term Management Plan for the Western Lakes'. The implication of applying a stock management element with the objective of reducing the entire population may have both uncertain and considerable negative outcomes for salmonids, by reducing elements of the pike populations, whose dietary habits are directly aligned to predation upon roach and other fish species on Natura 2000 sites. This is an important consideration in any review of the Plan.

#### Section 4.3.6 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

- 1) It is proposed here that there may be an adverse impact on the ecology of the Natura 2000 sites if "stock management plans" allow for pike to be removed from lake tributaries as a consequence of the 'Long Term Management Plan for the Western Lakes' without first considering if predation on salmon smolts is negligible based on smolt run patterns and the physical characteristics of the tributary, and as such the consultant appointed should consider this potential risk to the ecology of the lakes from the adoption of a generalised removal of pike in this instance, in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.
- 2) It is proposed here that Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, 7.2, which currently include measures associated with "stock management" on each of Western Lakes, are removed from the 'Long Term Management Plan for the Western Lakes' pending a complete review of all of the best evidence based research and modelling available as per Action 2.3 of Inland Fisheries Ireland's Corporate Plan (2021-2025) by the appointed consultants in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the impact of the Plan in each of the Natura 2000 sites.

# 4.4 POTENTIAL REMOVAL OF NATIVE SPECIES (PIKE) FROM NATURA 2000 SITES

The proposed 'Long Term Management Plan for the Western Lakes', specifically Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, & 7.2 propose considerable impacts to the pike populations as part of the "stock management plans" and the revision of legislative protection, on each of the Natura 2000 sites.

Pike are regarded by Inland Fisheries Ireland as a non-native species within the context of the EU Water Framework Directive (IFI, 2018), yet scientific research indicates that pike may have first naturally colonized Ireland 8000 years ago (Pedreschi et al. 2014). Inland Fisheries Ireland released a statement on 15<sup>th</sup> October 2013, that *"New Study Reveals Pike Native to Ireland"*.

The peer reviewed paper published by Pedreschi et al. in 2014, indicated using DNA evidence that pike may have first colonized Ireland 8000 years ago with a further two colonization events 4000 years and 1000 years ago. The conclusions of the paper were questioned by D. Ensing (2015) who suggested that pike could have been introduced by man 4000 years ago. Pedreschi & Mariani (2015) responded to Ensing in a published paper entitled "Towards a balanced view of pike in Ireland: a reply to Ensing" and stated their contention that Ensing's theory did not fit with the available scientific and historical evidence and that the opinion expressed was "too speculative and unsupported by data".

In 2018, Dr. Pedreschi met with the review group established by Inland Fisheries Ireland to review their current pike management policy on brown trout fisheries. Dr. Pedreschi stated that her research regarding pike colonization was

continuing, albeit slowly, however Dr. Pedreschi confirmed that the additional research using single nucleotide polymorphism (SNPs) was supporting the original conclusions.

It should be stated that although Inland Fisheries Ireland has maintained the non-native designation of pike within the context of the EU Water Framework Directive, and has collected pike samples for future studies, no further actual scientific research has been undertaken by Inland Fisheries Ireland regarding pike in the respective Natura 2000 sites to support the continued non-native position.

In contrast, Dr. Pedreschi stated during the presentation to the Review Group in 2018, that Irish pike *"are, or are more likely to be native"*, based on the available research. Considering this, there is considerable cause for concern that the current 'Long Term Management Plan for the Western Lakes' may negatively impact upon a potentially native species i.e. pike.

Pedreschi & Mariani (2015) interestingly stated that many ubiquitous freshwater species in Ireland remain to be investigated such as gudgeon, stoneloach, minnow and perch. To our knowledge, no research is planned for any of these Irish species.

Inland Fisheries Ireland has previously referred to archaeological evidence to support a non-native position on the Western Lakes, i.e. Lough Corrib. The completeness of the archaeological evidence has been raised with the CEO of Inland Fisheries Ireland. It is considered in this submission that the current evidence presented by Inland Fisheries Ireland to remove a potentially native species, is not conclusive and that using the precautionary principle, pike should not be removed as part of the 'Long Term Management Plan for the Western Lakes'.

New archaeological evidence of pike bones has been discovered in a grave in Ballyhanna, Co. Donegal in 2020. Evidence of the paper was obtained through a Freedom of Information request to Inland Fisheries Ireland. The small graveyard was excavated during a roadworks scheme. The calibrated dates for human remains in the graves, dated from 679AD to 1654AD, with most individuals laid to rest between 1200AD and 1600AD. It appears that the finding of pike bones is not usual, but the paper provides some insight into why this might be the case in general. The paper states that *"for methodological and taphonomic reasons fish bones are rarely recovered from archaeological sites"*. Recovery of a pike bone from Ballyhanna, however, was suggestive that fish formed at least part of the diet, however it is unknown how old the pike bone is, therefore it is possible that it could rest anywhere within the timescale discussed in the paper. <u>https://pureadmin.qub.ac.uk/ws/portalfiles/portal/215864227/Diet.pdf</u>

Further information on this matter is available in Appendix E of this submission and in Sections 4 & 5 of Appendix F.

# 4.4.1 IMPLICATION OF PIKE BEING MISS-CLASSIFIED IN CONTEXT OF EU WATER FRAMEWORK DIRECTIVE

It is considered here that the potential mis-classification of pike as non-native within the context of the EU Water Framework Directive undermines the ecological status of the Natura 2000 sites by:

- Down-grading the ecological status of the Natura 2000 sites by miss-classifying a native species;
- Negatively impacting on Ireland's prospects of complying with the EU Water Framework Directive;
- Seeking to remove a potentially native species without consideration for the potential adverse impacts on the food web and eco-systems in the Natura 2000 sites.

In consideration of the above, it is suggested that there is potential negative impact for the Natura 2000 site should the 'Long Term Management Plan for the Western Lakes' proceed without an assessment of the adverse impact of removing a potentially native species.

Pike is not the only species whose native status has been reviewed using scientific research. Teacher et. Al (2009) used microsatellite DNA to establish the native status of the common frog in Ireland. Reid et. Al (2013) on behalf of the National Parks and Wildlife Service (NPWS) conducted a National Frog Survey of Ireland in 2010/11. Reid et. Al (2013) commented that the *"origins of frogs in Ireland have been controversial, with early suggestions that they were not native but were introduced from Britain in the 17th century"*. They noted that genetic studies indicated one similar to that found in Britain and a second, distinct group unique to the south-west of Ireland and that the results imply *"two separate colonization events, probably both in the early postglacial period"*, one from the east and one from a Lusitanian refuge in or near county Kerry. Reid et. Al (2013) conclude that it is *"therefore, considered that the common frog is a longstanding native of Ireland"*.

Pedreschi et.al (2015) state that *"management should indeed take into account the findings of Pedreschi et al.* (2014), as they clearly document the existence of different evolutionary lineages of pike in Ireland".

# Section 4.4.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

1) It is suggested that the removal of pike as a potentially native species based upon the best available scientific evidence, will have an adverse impact on the integrity of the Natura 2000 sites and as such, the native status of pike in the Western Lakes should be clarified with certainty within the context of the 'Long Term Management Plan for the Western Lakes' and that management of the species should cease on the basis of existing research and that this be considered in the preparation of the Strategic Environmental Assessment Report, the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

2) It is suggested that the native status of perch is reviewed per the comments of Pedreschi & Mariani (2015) and that a scientific research study is undertaken by Inland Fisheries Ireland to examine the colonization of Ireland by perch and that the potential for this species to be native is assessed in the context of the 'Long Term Management Plan for the Western Lakes' in the preparation of the Strategic Environmental Assessment Report, the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 4.5 DISTURBANCE - IMPACT OF GILL NETS USED FOR STOCK MANAGEMENT IN NATURA 2000 SITES

Gill nets are used in Ireland for two distinctly different purposes. The first is to survey fish stocks, such as required under the EU Water Framework. The surveys are of short duration and provide useful overall data on fish stocks – the species, abundance and age profile.

The second type of gill nets are those employed in the act of stock management. These gill nets are used in the lakes named in the 'Long Term Management Plan for the Western Lakes'. They may be employed for a period of four months of the year, depending on the stock management plan drafted by Inland Fisheries Ireland. During 2022, gill nets will be used on Lough Corrib for five months i.e. during February, March, April, October and November. Gill net use on Lough's Conn and Cullin is planned for six months (inclusive of December) Ref:

https://www.fisheriesireland.ie/sites/default/files/2022-03/proposed-stock-managment-plan-2022.pdf

Gill nets used for stock management are indiscriminate with regard to the species they catch – pike, cyprinids, salmonids. Birds are also captured. Photos are included (See Section 4.5.3) and Section 17 of Appendix F.

It is considered here that the potential adverse effect of using gill nets, specifically for stock management on a Natura 2000 site should be assessed within the Strategic Environmental Assessment Report, the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 4.5.1 POTENTIAL IMPACT OF STOCK MANAGEMENT GILL NETS ON OTTERS

Annex II of the Habitats Directive provides for protection of the Otter (Lutra Lutra) in a number of the Natura 2000 sites.

A number of Conservation Objectives defined by attributes and targets apply to the conservation of Otters on the Lough Corrib SAC. The target is that there is no significant decline. Attributes applicable to gill netting include:

- Extent of freshwater lake habitat Target: No significant decline;
- Barriers to Connectivity Target: No significant increase;

For guidance, See Map 12 of Lough Corrib SAC 000297 i.e. NPWS (2017) and Map 8 of River Moy SAC 002298 i.e. NPWS (2016). The National Parks and Wildlife Service (2017) report notes the following with regard to otter commuting:

- Otters tend to forage within 80m of the shoreline;
- Otters will regularly commute across stretches of open water up to 500m e.g. between islands and between the mainland and islands It is important that such commuting routes are not obstructed;
- A Commuting buffer of 250m has been applied to the entire perimeter of Lake Corrib (See Map 12) and Lake Conn & Cullin (See Map 8);

Ref:

Lough Corrib -

https://www.npws.ie/sites/default/files/protected-sites/conservation\_objectives/CO000297.pdf

Lough Conn/Cullin -

https://www.npws.ie/sites/default/files/protected-sites/conservation\_objectives/CO002298.pdf

It could be argued that gill netting is an operational matter for Inland Fisheries Ireland and therefore it is not relevant in the context of a Natura Impact Statement or Appropriate Assessment regarding the 'Long Term Management Plan for the Western Lakes', however gill nets have been indelibly linked to the act of stock management over many decades.

Inland Fisheries Ireland may also suggest that Otters are not captured in gill nets. However, regarding Otter commuting, gill nets are principally placed within 80m of the shoreline and individual nets are linked together to provide a gang of nets typically 180m in length or in a number of gangs, depending on the location as decided by Inland Fisheries Ireland, therefore gill nets potentially act as 'disturbance'.

When one considers that gill nets are set for 5-6 months of the year in some of the Western Lakes, one can start to appreciate the potential impact on Otters. Otters may also be attracted to the nets by the trapped fish.

Photographic evidence of partially eaten and damaged fish supports the view that Otters may come into contact with gill nets accidently or otherwise.

As such, the potential adverse impact of gillnets on protected species in Natura 2000 sites is potentially considerable and needs to be assessed.

# 4.5.2 POTENTIAL IMPACT OF STOCK MANAGEMENT GILLNETS ON BIRDS

It is considered that the gill netting activities permitted by the 'Long Term Management Plan for the Western Lakes' will lead to disturbance of wintering and breeding birds on the Special Protection Areas and on the Natura 2000 sites generally, as there is considerable risk that the nets being set in littoral zones of the lake along with daily associated activity over a possible six-month period may have an adverse effect on the conservation interests of the sites.

Lough Sheelin SPA is known as a nationally important site for wintering waterfowl such as the protected Pochard (A059), Goldeneye (A067), Great Crested Grebe (A005) and the Tufted Duck (A061).

Lough Corrib SPA is known for the non-exhaustive list of protected bird species such as Shoveler (A056), Pochard (A059), Tufted Duck (A061), Common Scoter (A065), Coot (A125), Golden Plover (A140), Greenland White-fronted Goose (A395), Wetland and Waterbirds (A99). The National Parks and Wildlife Service state that the Lough Corrib SPA is an internationally important site which supports in excess of 20,000 wintering water birds, including the population of Pochard that is, itself, of international importance. Ref: https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004042.pdf

The conservation objectives relating to birds for the Natura 2000 sites is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for the Special Protection Areas, therefore the potential adverse impact of gill nets on conservation interests in these Natura 2000 sites needs to be assessed.

# 4.5.3 POTENTIAL IMPACT ON SALMONIDS – PRINCIPALLY BROWN TROUT INCLUDING GENERAL PHOTOS



The above photographs are a small selection of the photos available depicting damage to fish and birds from "stock management Plan" gill netting operations. Photos also show otter damage to trapped fish where otters are attracted to struggling fish in the nets.

Dr. P. Fitzmaurice (Inland Fisheries Trust - Internal Document, Circa 1975) – "Gillnets are very severe on any fish species" ... "Apart from the "burn" marks left by the net there is also the problem of fish being manhandled. Both of these agents remove the slime from the fish and subsequently leave the body of the fish open to bacterial and fungal infection"

1) It is proposed that the use of gill nets in each of the Western Lakes named in the 'Long Term Management Plan for the Western Lakes' may adversely impact on the Conservation Objectives of the Natura 2000 sites with regard to the disturbance of Annex ii Otters in SAC's and protected bird species in SPA's in the context of Plan where they are used to execute "stock management plans" and as such it is proposed that the use of gill nets should cease for the purpose of stock management in the Western Lakes, and that this is reviewed in the Strategic Environmental Assessment Report and by the consultant appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan. It is considered in this submission that there is 'Likely' and 'Significant' potential for impact on human health by the Actions contained in the 'Long Term Management Plan for the Western Lakes'.

# 4.6.1 STAKEHOLDER MARGINALISATION

Actions 4.4 & 5.3 specifically propose to 'encourage' and 'enable' one stakeholder group e.g. salmonid anglers, to remove and kill fish species of interest to other stakeholders i.e. principally pike angling stakeholders and potentially stakeholders of all coarse fish species. Recent photographs taken around Lough Corrib of pike with the bellies cut open and left hanging from trees and poles suggest that the environment for non-salmonid anglers is becoming more marginalised and deeply concerning, for adults and children. Inland Fisheries Ireland, through the current plan are perpetuating this concerning environment.

In contrast, pike angling and coarse angling stakeholder's practice 'Catch & Release' as part of their angling culture.

In addition, pike anglers recognise the ecological role of pike as an important predator and understand the implications of killing pike and the potential for this to negatively alter the stock dynamics of other fish species.

Inland Fisheries Ireland is also very aware of the link between 'Catch & Release' and pike anglers, and to predator angling stakeholders generally on the Western Lake <u>https://fishinginireland.info/2022/pike-reports/lough-corrib-</u> <u>pike-reports/3-predator-species-all-in-a-days-fishing-for-connacht-predator-anglers/</u>, however the 'Actions' proposed, will further marginalise some stakeholder groups and therefore, should be fully assessed.

#### Section 4.6.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

1) Actions 4.4 & 5.3 of the 'Long Term Management Plan for the Western Lakes' specifically propose to 'encourage' and 'enable' one stakeholder group to remove and kill fish species of interest to other stakeholders, with the significant potential to further marginalise pike and coarse angling stakeholders on the Western Lakes, and as such it is proposed, on the grounds of 'Population and Human Health' that Actions 4.4 & 5.3 are assessed in the Strategic Environmental Assessment Report and by any consultant or body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

It is considered in this submission that there will 'Likely' be 'Significant' impacts upon areas of special amenity and adverse visual impacts by the Actions contained in the 'Long Term Management Plan for the Western Lakes'.

# 4.7.1 IMPACT UPON AREAS OF SPECIAL AMENITY

The Western Lakes are areas of outstanding natural beauty, scientific interest, and recreational amenity value to all angling disciplines, not only to salmonid anglers.

The historical significance that pike anglers place upon the Western Lakes is fuelled by that wonderful body of work entitled 'Mammoth Pike', a book written in the 1970's by the late Fred Buller, an angling historian. Fred Buller captured the imagination of Irish and overseas pike anglers who seek those really big pike in the 30lb to 40lb size bracket, and Ireland's Western Lakes have become the focal point of that search with the added bonus of being Ireland's most challenging and most beautiful fisheries.

The 'National Strategy for Angling Development' publication of 2015 stated that "*current pike management policies may impact negatively on Ireland's reputation as a prime pike angling destination*".

https://www.fisheriesireland.ie/sites/default/files/migrated/docman/2015/nsad/NSAD%20Work%20Package%203% 20FINAL%2018Nov15.pdf Pike management policies only take place on the Western Lakes, and are engrained within Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 of the 'Long Term Management Plan for the Western Lakes'. However, the Western Lakes represent in excess of 26% of Irelands lake waterbodies, therefore the impact upon Ireland's amenity and upon Ireland's image, is not insignificant.

The impact of Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 also likely affects angler choices and whether they choose to fish the Western Lakes, or more particularly, their choice of whether or not to visit any fishery where pike management is undertaken.

Curtis (2017) found that 61% of trout anglers surveyed during a 'choice experiment' were negatively disposed to gillnetting and that they are 3 times as likely to visit a fishery with no pike controls. This in itself gives some indication that a majority of salmonid anglers surveyed place more importance upon issues, other than 'pike management'.

The Western Lakes are an untapped amenity for all anglers has significant untapped domestic and overseas tourism potential, for all angling disciplines to enjoy. Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 of the 'Long Term Management Plan for the Western Lakes' are a significant impact upon that amenity.

#### Section 4.7.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

 Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 of the 'Long Term Management Plan for the Western Lakes' are likely to have a significant impact upon the Western Lakes and the enjoyment and participation of angling by all angling disciplines, and as such it is proposed, on the grounds of 'Landscape' as an 'Environmental Component' of the Plan, that the 'Impact upon Areas of Special Amenity' of Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 are assessed in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 4.7.2 OCCURRENCE OF ADVERSE VISUAL IMPACTS

The impact of Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 is likely to lead to the occurrence of adverse visual impacts on the Western Lakes and is already doing so. The photographs below indicate what anglers can expect to see on the Western lakes. Pike and coarse anglers, along with numerous salmonid anglers are disgusted by these scenes.





# Section 4.7.2 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

 Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 of the 'Long Term Management Plan for the Western Lakes' are likely to lead to significant 'Adverse Visual Impacts' on the Western Lakes and as such it is proposed, on the grounds of 'Landscape' as an 'Environmental Component' of the Plan that the impact of the 'Occurrence of Adverse Visual Impacts' of Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 are assessed in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 5 THE "BEST SCIENTIFIC KNOWLEDGE"- INTERACTION BETWEEN PIKE AND SALMONIDS, TROUT (SALMO TRUTTA)

The interaction between pike and trout has caused much debate over many decades. Regrettably, much of this debate took place within an environment of narrowly focused data gathering and reports, produced and relied upon over many years by Inland Fisheries Ireland and its predecessors.

An example was the dearth of knowledge available on pike diet over an entire season. A number of Inland Fisheries Ireland reports, concluded most notably during the 1990's that seasonal diet studies of pike e.g. in Lough Corrib should be undertaken to review the stock management decisions taken on the snapshot data available at the time. FOI requests to Inland Fisheries Ireland over a decade later confirmed that the recommended seasonal diet studies were simply not undertaken (See Section 9.4.1.3 of Appendix F). This position existed until 2013 when Inland Fisheries Ireland and UCD undertook a suite scientific research studies on pike, including pike diet.

Inland Fisheries Ireland has thankfully progressed its knowledge and research into pike, having produced a number of peer reviewed papers in the past four years. A number of very important matters have been scientifically investigated. A report launched in 2018 entitled "*Pike (Esox lucius) in Ireland: Developing Knowledge and Tools to Support Policy and Management*" indicated that pike in Irish waters may have changed their diet preferences. The report looks at new research carried out on Lough Conn, County Mayo and Lough Derravaragh, County Westmeath in 2016 and provides an insight into the dietary habits of pike now that roach are established in many of the fisheries named in the 'Long Term Management Plan for the Western Lakes'. The research also examined if pike and brown trout can co-exist in the same habitat and the conditions for this co-existence.

Retired CEO of Inland Fisheries Ireland, Dr Ciaran Byrne, said at the launch: *"This research was initiated to answer some on-going questions relating to the dietary preference of pike and the pike-brown trout interactions in lakes across Ireland. Previous studies in this area were carried out more than 50 years ago which is a long time within our changing lake systems"*.

# 5.1 SCIENTIFIC RESEARCH - EVIDENCE OF A REDUCED PREDATION IMPACT ON TROUT

Mc Cloone et. al (2019) examined the changes in pike diet that have taken place in lakes where roach have become established, and sought to establish if this changed the previously recorded predation on trout on these lakes. One of the test sites was Lough Conn in County Mayo, within the River Moy Special Area of Conservation and a Natura 2000 site included in the 'Long Term Management Plan for the Western Lakes'.

Monthly sampling of pike was undertaken on Lough Conn and Lough Derravaragh from August 2016 to July 2017. Pedreschi et al. (2015) conducted short-term studies of pike diet in a number of Irish lake systems, and highlighted the need for a longer-term seasonal diet study to assess whether diet has been influenced by the colonization of roach. Mc Cloone et. al (2019) used standardised electrofishing to capture pike. Gastric lavage, a non-lethal method, was used to obtain stomach content samples of pike.

Diet information was available from 4667 pike in the historical period and 636 pike from the recent period to represent corresponding size classes. Prey were found in a high proportion of the stomachs of pike in both 'small' and 'large' tested size. The assertion that only large pike were piscivorous was not supported (Mc Cloone et al., 2019).

There was no evidence to support the hypothesis that trout are currently selectively predated by pike in Irish lakes (Mc Cloone et al., 2019). This would appear to question the justification for pike management in the Plan.

The new findings relating to the diet of pike and the dominance of roach in the diet is very important. It would indicate that the Plan must carefully consider any potential "stock management" on a number of grounds:

- Has the Plan considered current research into pike diet in each of the lakes?
- Has the effectiveness of ongoing management actions been assessed with regard to their impact on the ecology of each lake named in the Plan?

#### Section 5.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

1) It is proposed here that there may be an adverse impact on the ecology of the Natura 2000 sites contained in the 'Long Term Management Plan for the Western Lakes', should the dominance of roach found in recent pike diet research not be assessed in the context of proposing a "stock management plan" for each of the Natura 2000 sites and as such, this should be reviewed specifically for each Natura 2000 site in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 5.2 SALMONID CONSERVATION – THE IMPACT OF PREDATOR REMOVAL ON TROUT IN MODIFIED LAKES

Shephard et. al (2018) studied the relationship between removing a predator e.g. pike and what factors may influence the response of salmonid stocks to this measure.

The authors found that on Lough Sheelin, roach as an alternative prey species for pike, had modified the predatorprey interactions between pike and trout. The authors suggested that this now affected the potential efficacy of pike removal as a trout fisheries management tool.

The authors found that on Lough Sheelin, trout abundance declined in years of high chlorophyll a concentration and they suggested that to remove top predators may have unanticipated effects on target fish stocks in systems where there are multiple anthropogenic pressures.

#### Section 5.2 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

 It is proposed here that there may be an adverse impact on the ecology of the Natura 2000 sites contained in the 'Long Term Management Plan for the Western Lakes', by removing predators from Natura sites where there are ongoing anthropogenic pressures and as such, this should be reviewed specifically for each Natura 2000 site in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 5.3 SCIENTIFIC RESEARCH – POSSIBLE CO-EXISTENCE OF PIKE AND TROUT IN LARGE WELL-CONNECTED LAKES

Mc Cloone et al. (2018) investigated the factors which combine to provide an environment for the coexistence of pike and brown trout in Irish lakes. The authors recognized that both species are highly valued, particularly by anglers and that pike management in Irish lakes is the subject of considerable debate amongst stakeholders.

The authors examined 522 lakes with current or historical records of containing pike. The authors found that all of the study lakes >600 ha support existing trout and pike stocks and offer angling opportunity for both species. Lake area (ha), mean air temperature, mean and maximum lake depth (m) lake elevation (m), alternative prey and system connectivity were calculated for each fishery from which a model was derived.

In large well-connected lakes with deep areas and acknowledging the statistical uncertainty surrounding the model outputs, it was deemed likely that pike and trout could coexist in such systems, as there is a strong positive effect on lake size in determining the probability of co-existence of S. trutta and E. lucius in individual Irish lakes (Mc Cloone et al., 2018). Only the largest deepest lakes with strong connectivity can be confidently assumed to have a high probability of successful co-existence (Mc Cloone et al., 2018).

All of the lakes contained in the 'Long Term Management Plan for the Western Lakes' exceed 600 ha in area. Most of the iconic wild brown trout lakes in Ireland that contain pike are large, well connected and have deep water refuges. Acknowledging the statistical uncertainty, it is likely that E. Lucius and S. trutta would be able to co-exist in such systems (Mc Cloone et al., 2018).

#### Section 5.3 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

1) It is proposed here that there may be the potential for adverse impacts on the ecology of the Natura 2000 sites by removing pike from sites where the best evidence based research and population modelling by Inland fisheries Ireland's own published research acknowledges the potential for co-existence of pike and trout, and therefore the co-existence potential based upon the best available scientific evidence should be reviewed in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

# 5.3.1 PIKE AND TROUT IN SMALL LAKES – COMMENT ON CO-EXISTENCE AND THE DISPERSAL OF FISH SPECIES

The introduction of pike into low-complexity systems could be devastating to existing trout populations (Mc Cloone et al., 2018). This point is not disputed however the mode of dispersal for any new species is an area where conclusions are immediately drawn that it must be an anthropogenic introduction. This possibly erroneous conclusion may lead to speculative comments upon which management decisions are then founded. One such recent event took place on the Owenriff catchment, which is a tributary of Lough Corrib where pike were not previously recorded, though when precisely pike found their way into the Owenriff system remains unresolved.

# Owenriff River Catchment, Co. Galway

Prior to 2009, there were no official records of pike being present in the Owenriff catchment (IFI, 2018). The Irish Times newspaper carried a story on 21<sup>st</sup> October 2009, depicting the finding of pike as an act of "environmental vandalism". Ref: The Irish Times <u>https://www.irishtimes.com/news/release-of-pike-into-salmon-lakes-an-act-of-</u> <u>vandalism-1.759829</u> The story drew a response from a well-respected and well known angler and contributor to the now defunct "Irish Angler Digest" magazine in the edition of January 2010, where it was reported that he had personally caught pike and trout during an angling holiday in the Owenriff catchment in September 1994 (A copy of the article is available). Apart from suggesting that the comment regarding "environmental vandalism" may have been inappropriate, it raises the question of how reliable are historical fish stock surveys to advise us of the precise species that exist in a water at a point in time. Regarding the Owenriff catchment, we simply now cannot say with certainty when pike actually first colonised the system, but more importantly it questions the validity of speculating on salmonid stock dynamics within the Owenriff catchment without considering this possibility.

# Aughrusbeg Lough, Co. Galway

More recently, Inland Fisheries Ireland on Wednesday on the 11<sup>th</sup> August 2021 publicised that "Pike have been confirmed in Aughrusbeg Lough, Co. Galway". This is a small and apparently low-complexity water with a low brown trout population based upon EU Water Framework Directive (WFD) fish stock surveys carried out in 2007, 2010 and 2013. The full results of an additional 2021 survey have not been made available as yet. No brown trout were captured in the survey in 2007 (Kelly et al. 2014), which would indicate the difficulty in assessing the existence of new species or the disappearance of existing species without a continuous survey programme and possibly the difficulty of linking poor survey returns with species expiration. A striking feature in the 2010 WFD survey is the existence of rudd (Scardinius erythropthalmus) up to 7+ years old indicating a population of rudd has existed in the lake since for at least 18 years. Kelly et al. (2014) state that archival Inland Fisheries Trust data and angling references indicate that eels and brown trout were the only species present in the lake. This raises the question of how rudd originally colonized Aughrusbeg Lough prior to, or circa 2003, and questions why the apparently new species did not warrant comment in the IFI report of 11<sup>th</sup> August 2021.

### Alternative Mode of Dispersal of Fish Stocks

It is considered here that the appearance of fish in new lakes may not always be by anthropogenic means and that the mode of dispersal may be more complex. Minchin (2007) considered the capability of birds to spread species inadvertently on the body or in the gut. Recent research identified an overlooked dispersal mechanism in fish, providing evidence for bird-mediated dispersal ability of soft-membraned eggs undergoing active development (Lovas-Kiss et al., 2020). This supports previous research specifically in relation to the natural dispersal of pike and perch (Thienmann A., 1950) & (Preusse O., 1925).

It is proposed here that it may be reasonable to consider other more complex but natural modes of dispersal regarding the appearance of new species where they did not apparently exist. This mode is further supported when one considers that Ireland has approx. 165 designated Special Protection Areas (SPA) for over 50 species of water birds. Two SPA's adjacent to the Owenriff river catchment are the Connemara Bog Complex SPA and the Lough Corrib SPA, which itself provides protection for 14 listed bird species.

#### Section 5.3.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

1) It is proposed here that there may be the potential for the ecology of Natura 2000 sites to be naturally altered by bird-mediated modes of dispersal of fish species, the potential of which may be elevated on or near to Special Protection Areas, and as such the potential for the natural dispersal of fish species and all available published research should be reviewed by the consultant / body appointed to prepare the Natura Impact Statement (NIS), the Appropriate Assessment (AA) and Strategic Environmental Assessment Reports regarding any management decisions taken that are relevant to the 'Long Term Management Plan for the Western Lakes' or to any future management plans.

#### 5.4 TROUT AND PIKE FISHERY – SCIENTIFICALLY EVALUATED MANAGEMENT OPTIONS

Fitzgerald et al. (2019) evaluated management options for a combined trout and pike fishery and tested a range of scenarios for management of the pike and trout fisheries, under three different hypotheses about the abundance of non-trout prey availability. Lough Conn was used as a test site due to the availability of pike dietary data and realistic annual trout catch data.

The model outcomes indicated that pike removal may enhance trout stocks in systems with little alternative prey, but that it would be unlikely to be effective in most of the designated trout lakes due to colonisation by roach (Fitzgerald et al., 2019).

The authors commented that actual rates of trout angling were found to impose an important pressure on the modelled trout population. The model behaviors were said "to be robust to realistic levels of uncertainty".

Fitzgerald et al. (2019) commented that in all cases, "the model indicates that a greater biomass of alternative prey (in the same size range as trout) diminishes the predation mortality on trout, which modifies the potential utility of pike removal as a trout conservation tool". The study states this effect "has been observed empirically in one of the designated Irish trout lakes (Lough Sheelin), where non-native roach have become established" and "now constitute an important prey species for pike".

#### Section 5.4 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

 It is proposed here that 'Scientifically Evaluated Management Options' aligned to Section 2.3 of Inland Fisheries Ireland's Corporate Plan, and based upon the modelling of alternative prey available for pike, should be prepared for each of the Lakes named in the 'Long Term Management Plan for the Western Lakes' prior to any decision taken to introduce "stock management plans" under Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, 7.2 and that the adverse impact or uncertainty of any option should be reviewed using ecologically sound scientific evidence within the Strategic Environmental Report, and by the consultant appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 6 REFERENCE TO INLAND FISHERIES IRELAND – REVIEW OF POLICY (2018) – MANAGEMENT OF PIKE IN DESIGNATED WILD BROWN TROUT FISHERIES

Every 3 years, Inland Fisheries Ireland (IFI) review management policy such as pike management on waters referred by IFI as designated as wild brown trout fisheries. The management review process considers existing policy, current scientific research and stakeholders views. A steering group is formed for this purpose. The current policy dated August 2014, incorporates all of the lakes named in the 'Long Term Management Plan for the Western Lakes'.

The current policy was reviewed initially in 2012 and enacted in 2014. In 2018, the policy was reviewed again, however on this occasion, the availability of peer reviewed scientific research on pike biology, it's native status and the pike's potential to co-exist with trout (salmo trutta) had improved immeasurably from what was available in 2012.

In November 2018, a set of proposed recommendations were presented for the consideration of the IFI Senior Leadership Team (SLT) by the Chairman of the steering group, Mr. Sean Long. It was anticipated that the recommendations would be reviewed by the SLT and presented to the board of IFI in 2019 by the then IFI CEO, Mr. Ciaran Byrne, with the expectation that a revised policy - based on the new scientific research, would be released in late 2019. At a meeting in Dail Eireann a commitment was given on June 19<sup>th</sup> 2019 by Minister Sean Canney to both IFPAC and IPS that all stages of the Pike Review would be completed by September 2019. The then Minister specifically instructed the IFI CEO that this work was to be completed and issued to stakeholders.

As of August 2022, IFI have not amended its current policy, therefore any benefit accruing from the valuable suite of new scientific research published since 2013, and the deliberations of the review group, who gave up valuable time to participate in the review, has not been incorporated into any revised policy. In addition, none to the proposed recommendations have been incorporated into the 'Long Term Management Plan for the Western Lakes'.

The failure of the Board of Inland Fisheries Ireland and Senior Management, to close out the Pike Policy Review of 2018 before proceeding onto the current 'Long Term Management Plan for the Western Lakes' displays a considerable lack of engagement with stakeholders, particularly the pike angling stakeholders who participated until the end of the review and gave their time and not inconsiderable personal cost, willingly over 24 months.

This failure does not align with the expected governance of Inland Fisheries Ireland and with the Chairpersons forward in Inland Fisheries Ireland's Corporate Plan 2021-2025 which states that *"Governance comprises the systems and procedures under which organisations are directed and controlled. A robust system of governance enables the organisation to operate effectively and to discharge its responsibilities as regards transparency and accountability to those we serve".* 

#### Section 6 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

It is proposed here that prior to approval or otherwise for any action in the 'Long Term Management Plan for the Western Lakes' by the DECC, that Inland Fisheries Ireland clarifies the following:

- a) Has Inland Fisheries Ireland considered the recommendations of the Pike Policy Review Group during the deliberations undertaken for the Plan?
- b) Which recommendations of the Pike Policy Review Group have been inserted into the Plan?
- c) Do the authors of the 'Long Term Management Plan for the Western Lakes' believe the Plan aligns with IFI's Corporate Governance systems and procedures, and how was that undertaken at a) conceptual stage, and in b) the drafting of the Plan?
- d) Provide a scientific report by the Research Division detailing how each Action in the Plan is based on the best evidence-based research and modelling available, as per Action 2.3 of Inland Fisheries Ireland's Corporate Plan (2021-2023);
- e) Provide details of the resources and funding required for each Action of the Plan, as per Page 8, paragraph3 of the Plan;
- Provide details of the funding source for each individual Action in the Plan and provide confirmation if funding in principal has been secured for each;
- g) Provide definitive details and the metrics to be used to show of how Inland Fisheries Ireland intends to measure improvements or otherwise, in each of the Western Lakes;
- h) Provide definitive details of the measurable goals / KPI's of the Plan for each of the Lakes in terms of each fish species and the frequency of those KPI's;

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# Appendix A

# (Part) FOI Email 6<sup>th</sup> October 2016 Re: Original Salmonid Designation Comment (Redacted in this document)

From: Grea Forde: To: Carao Byrns: El Hodds: Sean Long Cc: Eona Hanns: Hary Lanta Subject: Re: Mke Trout Working Group Date: 06 October 2016 12:22:29

Hi all,

management option) (Als) what is the position of a designated wild brown trout fishery ... We no longer have the branded fisheries from Bord Failte (which is where the designation initially came from and was embraced widely) as was the case in the past. Some lakes that were managed

Greg Forde Ceann na n-Olbríochtái Head of Operations

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Document No.: P220901/001

# Appendix B

# **Current Non-Peer Reviewed Research Supporting Stock Management**

# Inland Fisheries Ireland Website - Image August 2021

Why is there a need for slock management operations?
Stock Management is undertaken on certain waters which are managed by IFI as wild brown trout fisheries. Such waters are identified in IFIs pike and trout management policies. These stock management operations are informed by previous scientific mewarch, are based on best practice and carried out in accordance with IFIs pike and trout management policies under strict standard operating procedures.
Further information on the above policies and standard operating procedure can be obtained at
[2] Indard Fashennia, Immond Piller, Policie, Hold KBO (2) Indard Fashenian Indiand Brown Tool: Policy (HS2 AR)
Further information on the operating procedures for stock management through gilinetting and electrafishing can be found here
(2) Standard Operating Processors (20P) For Press management operations upon any description approach (2.16 MI).
The research used to inform the policies is available here:
<ul> <li>Of the Clarmed Guided of Fight Stockes in Lowph. Sheeps: March. 2000 (1996) KSI</li> <li>Clausetti Disertin Rescot 2012 (274 MB)</li> <li>S. A. Bowtes of Charopean. In the Fash Stockes of Lowph. Lowps. Lower. 2012 (105 KB)</li> <li>A. Francisco of Charopean. In the Fash Stockes of Lowph. Lower. 2012 (105 KB)</li> <li>A. Francisco of Charopean. In the Fash Stockes of Lowph. Lower. 2012 (105 KB)</li> <li>A. Francisco of Charopean. Charopean. Control and the Charopean (2017 KB)</li> <li>A. Francisco of Charopean. Control and the Charopean (2017 KB)</li> <li>The Microsoft for Controlling Place Bitcoint in Storms Quality. Into: Weld Bitcoint Throut Management (1.88)</li> <li>The Microsoft for Controlling Place Bitcoint in Storms Quality. Into: Weld Bitcoint Throut Management (1.88)</li> <li>The Microsoft for Controlling Place Bitcoint in Storms Quality. Into: Weld Bitcoint Throut Management (1.88)</li> <li>The Analysis of Controlling Place Bitcoint in Storms Quality. Into: Weld Bitcoint Throut Management (1.88)</li> <li>The Microsoft for Controlling Place Bitcoint in Storms Quality. Into: Weld Bitcoint Throut Management (1.88)</li> <li>The Analysis of Analysis in Lowph. Control 1.54 MBH</li> </ul>

# Appendix C

# Relevant Peer Reviewed Research of Note Regarding Irish Pike – Post 2013

Fitzgerald, C.J., Shephard, S., McLoone, P., Kelly, F., & Farnsworth, K. (2019). *Evaluating management options for two fisheries that conflict through predator–prey interactions of target species*. Ecological Modelling, 410, 108740.

McLoone, P., Fitzgerald, C., O' Reilly, S., Shephard, S. and Kelly, F.L. (2018) *Pike (Esox lucius) in Ireland: Developing Knowledge and Tools to Support Policy and Management*. National Research Survey Programme, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

McLoone, P., Shephard, S., Delanty, K., Rocks, K., Feeney, R., & Kelly, F. (2018). *Coexistence of pike Esox lucius and brown trout Salmo trutta in Irish lakes.* Journal of fish biology, 93(5), 1005–1011. <u>https://doi.org/10.1111/jfb.13811</u>

McLoone, P., Shephard, S., O'Reilly, S., & Kelly, F. (2019). Shifts in diet of an apex predator following the colonisation of an invasive fish. Hydrobiologia, 1-14.

Pedreschi, D., Kelly-Quinn, M., Caffrey, J., O'Grady, M. & Mariani, S. (2014) *Genetic structure of pike (Esox lucius) reveals a complex and previously unrecognized colonization history of Ireland*. Journal of Biogeography, 41, 548– 560.

Pedreschi, Debbi & Mariani, Stefano & Coughlan, J. & Voigt, Christian & O'Grady, M & Caffrey, Joe & Kelly-Quinn, Mary. (2015). Trophic flexibility and opportunism in pike Esox lucius. Journal of fish biology. 87. 10.1111/jfb.12755.

Shephard, Samuel & Delanty, Karen & O'Grady, Martin & Kelly, Fiona. (2018). *Salmonid Conservation in an Invaded Lake: Changing Outcomes of Predator Removal with Introduction of Nonnative Prey*. Transactions of the American Fisheries Society. 148. 10.1002/tafs.10132.

# Appendix D

Summary of 66no. Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items (Note: To be read in conjunction with full submission and Section descriptions)

# 3 OVERARCHING SUBMISSION RELATED TO THE PROPOSED 'LONG TERM MANAGEMENT PLAN FOR THE WESTERN LAKES'

The following items are to be read in conjunction with all other Sections in the Submission including all Appendices.

# 3.1 THE SALMONID DESIGNATION – IS IT FIT FOR PURPOSE?

#### Section 3.1.1 - Proposed Management Plan – Submission Item:

 This submission considers that all species can be accommodated on the Western Lakes without compromising the status of the lakes as producers of quality trout and salmon angling – provided only, that measures specifically designed to elevate the importance of the spawning and nursery catchments, and water quality issues, are the primary focus of the plan.

#### Section 3.1.2 - Proposed Management Plan – Submission Item:

2) This submission considers that the salmonid designation should be reviewed in terms of how Inland Fisheries Ireland links culling to the designation, and as such, this submission proposes that an angling tourism product risk review regarding angling for all species affected in the Western Lakes and also generally to Ireland's angling tourism product takes place, before any plan regarding the Western Lakes is adopted.

# Section 3.1.3 - Proposed Management Plan – Submission Item:

3) This submission considers that the plan does not meet Inland Fisheries Ireland's Corporate Plan (i.e. HLO 03 – Action 3.2) objective to manage state owned fisheries for the benefit of all stakeholders, and therefore the plan marginalises non-salmonid stakeholders, and discriminates against pike angling stakeholders in particular, and coarse angling stakeholders generally.

#### Section 3.1.4 - Proposed Management Plan – Submission Item:

- 4) This submission considers that DNA evidence suggests that the plan does not meet Inland Fisheries Ireland's Corporate Plan (i.e. HLO 02 – Action 2.3) objective to develop fishery management plans in light of best evidence-based research and modelling available, based upon the possibility that the plan seeks to remove and cull a potentially unique strain of naturally colonised native Irish pike from the Western Lakes, and as such all culling and removal of pike should cease.
- 5) This submission considers that in light of the conclusions of Pedreschi & Mariani (2015) stating that many ubiquitous freshwater species in Ireland remain to be investigated such as gudgeon, stoneloach, minnow and perch, that scientific research should now be undertaken by Inland Fisheries Ireland to scientifically examine the possible native status of these additional species and that Inland fisheries Ireland should advise of its intentions in this regard.

# Section 3.1.5 - Proposed Management Plan – Submission Item:

- 6) This submission considers that the artificial increase of the brown trout populations above natural capacity on the Western Lakes inter-alia the management culling operations executed on other species in that pursuit, compromises the objectives of the EU Habitats Directive for SPAs, SACs and Natura 2000 sites and puts at risk many of their Qualifying Interests and as such should be reviewed in the context of a Natura Impact Statement and Appropriate Assessment carried out on the Natura 2000 sites.
- 7) This submission considers that Inland Fisheries Ireland should provide data on biomass, density and length frequency distribution of the current existing trout stocks in each of the Western Lakes and also the optimum trout stock that it considers stocks need to be increased to, or reduced by to ensure a sustainable trout stock in each of the Western Lakes, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.
- 8) This submission considers that Inland Fisheries Ireland should provide data on biomass, density and length frequency distribution of the current existing pike stocks in each of the Western Lakes and define what the numerical objectives of the plan are in regard to those stocks, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

- 9) This submission considers that Inland Fisheries Ireland should provide data on biomass, density and length frequency distribution of the current existing perch, roach and bream stocks in each of the Western Lakes and define what the numerical objectives of the plan are in regard to those stocks, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.
- 10) This submission considers that Inland Fisheries Ireland have not provided for any additional trout angling conservation regulations within the 'Long Term Management Plan for the Western Lakes' and that Table 1 (P17) of the plan clearly defines a wide variance in current regulation (e.g. 2 fish per day legally killed on Lough Sheelin to unlimited killing of trout per day on Lough Conn and Cullin), reflecting a loose conservation of trout on the Western Lakes, and therefore reflecting the prevalence of trout believed to presently exist on the Lakes, and as such Inland Fisheries Ireland are requested to provide scientifically based reasons for this omission, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

#### Section 3.1.6 - Proposed Management Plan – Submission Item:

11) This submission considers that the proposed plan does not align with Inland Fisheries Ireland's Corporate Plan - HLO 03 – Action 3.2 in the first instance at high-level for the benefit of all stakeholders (See P45, 46 & 47 - Actions 4.1, 4.4, 5.1, 5.3 & 5.4 of the plan). Therefore, it is requested that IFI show how it has engaged with non-salmonid stakeholders (e.g. pike anglers, local businesses such as pike angling guides, pike angler friendly accommodation and local services etc.), to specifically assess community interest and fishery utility impact relating to the artificial and purposeful destruction of their fish stocks within the proposed plan, inter-alia the decreased utility of the fishery?

#### Section 3.1.7 - Proposed Management Plan – Submission Item:

12) This submission considers that Inland Fisheries Ireland should review historical data relating to habitat destruction and water quality reduction on each of the Western Lakes to establish salmonid population responses related to environmental improvement on each of the Western Lakes.

# 3.2 DEFICIENCIES IN ALIGNMENT OF THE PLAN TO IFI'S CORPORATE PLAN (2021-2025)

#### Section 3.2.1 - Proposed Management Plan – Submission Item:

13) This submission considers that the proposed plan does not align with Inland Fisheries Ireland's Corporate Plan - HLO 02 – Action 2.3 in the first instance at high-level (See P45, 46 & 47 - Actions 4.1, 4.4, 5.1, 5.3 & 5.4 of the Plan). Therefore, it is requested that Inland Fisheries Ireland provide definitive scientific comment that shows that the plan has been appraised, based upon evidence-based management (EBM) and shows how the best peer-reviewed scientific evidence available has been used to support each of the individual actions mentioned in this item, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

#### Section 3.2.2 - Proposed Management Plan – Submission Item:

- 14) This submission considers that the proposed plan has not addressed the "serious concerns" expressed by Inland Fisheries Ireland's Research Division regarding the document entitled "The role of IFI science in informing policy and management in fisheries" relating to Action 4.4 and 5.3 (See P46 & P47) of the 'Long Term Management Plan for the Western Lakes'. Therefore, it is requested that Inland Fisheries Ireland's Development Section and Senior Management provide definitive scientific comment on each of the 45 queries raised by the Research Division in the aforementioned document, and that these are made publicly available, prior to proceeding further with the proposed plan, or any future management plans or activities planned for the Western Lakes.
- 15) The document entitled **"The role of IFI science in informing policy and management in fisheries"** states that the stock size for brown trout and pike "is unknown" on the Western Lakes" and questions "on what basis is culling effort being defined". It is requested here that Inland Fisheries Ireland's Development Section and/or Chief Executive Officer provide the evidence-based research to support culling effort in response to this query regarding pike stock management proposed within the following:

  a) The proposed plan, and

b) The current 2022 pike management plans presently being enacted on each of the Western Lakes.

16) This submission considers that the proposed plan has not provided any evidence to show that the pike stocks in each of the individual Western Lakes are large and in need of reducing. It is requested here that Inland Fisheries Ireland provide the evidence-based research that has determined that stocks need reducing, for each individual Western Lake.

- 17) This submission considers that recent international scientific publications from Inland Fisheries Ireland's own Research Division indicate that pike removal may have a neutral or negative impact on brown trout populations in lakes having established roach populations. It is requested here that Inland Fisheries Ireland provide details of peer-reviewed evidence-based research that is being used to justify the removal of pike as a brown trout stock enhancement tool within:
  - a) The proposed plan, and
  - b) The current 2022 pike management plans presently being enacted on each of the Western Lakes.
- 18) This submission considers that the proposed plan has not provided any evidence to show what outcome the stock management element of the proposed plan will have on the fish community dynamics and brown trout abundance in each of the Western Lakes. It is requested here that Inland Fisheries Ireland provide details of peer-reviewed evidence-based research to show what improvement in brown trout abundance and salmon and fish community dynamics generally will take place on each of the Western Lakes, in response to:
  - a) The proposed plan, and
  - b) The current 2022 pike management plans being enacted on each of the Western Lakes.

#### Section 3.2.3 - Proposed Management Plan – Submission Item:

- 19) This submission considers that the stock management aspect of proposed plan is not informed by "best practice evidence-based management (EBM)" and as such, Actions 4.1, 4.4, 5.1, 5.2, 5.3 & 5.4 (See P46 & P47) of the proposed 'Long Term Management Plan for the Western Lakes' are likely to lead to adverse and uncertain impacts on the Natura 2000 sites and should be removed from the plan. In addition, there has been no evidence provided to show how these risks have and would be considered at High-Level stage in the form of a Natura Impact Statement (NIS) and Appropriate Assessment (AA) specifically for each of the High-Level Actions mentioned in this section.
- 20) This submission proposes in the first instance, that stock management ceases on each of the Western Lakes pending a review of the application of existing best evidence peer-reviewed research, and the completion of any continued long-term studies (e.g. per IFI document IFI/2021/1-4562) to align any future stock management proposals to Inland Fisheries Ireland's Corporate Plan (2021-2025) HLO 02 Action 2.3.

21) This submission requests an answer to the query raised by the IFI Research Division (Appendix G) to IFI Management requesting on what scientific basis is it known that "it is essential that pike stocks are kept under control" – The proposed Plan provides no published scientific evidence to answer this fundamental question regarding the Western Lakes on the basis of the current scientific evidence, and it is requested here that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

#### Section 3.2.4 - Proposed Management Plan – Submission Item:

- 22) This submission considers that the continued research proposed by the Research Division (See IFI/2021/1-4562) represents an opportunity to build upon the existing research and to inform management, without dismissing the existing findings of McLoone et al., (2018). It is proposed that this research:
  - A) Is undertaken in full prior to any stock management decisions taken on the Western Lakes,
  - B) That Inland Fisheries Ireland confirms that funding has been secured to complete the research, and
  - C) That Inland Fisheries Ireland confirms the precise commencement and completion dates of the study.

#### Section 3.2.5 - Proposed Management Plan – Submission Item:

- 23) This submission considers that the continued research proposed by the Research Division (See IFI/2021/1-4562) contains a 'Citizen Science' element. It is proposed here that any engagement with anglers in the collection of samples or during competitions / events of any kind, is informed by detailed information and a Standard Operating Procedure drafted between the Research Division and Pike Angling National Bodies, to include, but not be limited to:
  - A) Agreed conditions of engagement;
  - B) The creation of a register for anglers from which anglers can be added, or removed;
  - C) Description of all aspects of the process such as non-lethal handling and retention;
  - D) Minimum requirement for angling equipment;
  - E) Prior IFI Management response to all 45 questions drafted by the Research Division in document entitled

#### "The role of IFI science in informing policy and management in fisheries";

E) Cessation of all IFI Section 59 authorisations to cull pike on the Western Lakes;

#### Section 3.2.6 - Proposed Management Plan – Submission Item:

24) This submission proposes that It will be necessary for Inland Fisheries to detail an 'Adaptive Management Programme' to scientifically research the link between water quality improvements and fish species responses in the Western Lakes and secure specific funding from DECC for enhanced ecological testing and monitoring to facilitate the programme, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

# 3.3 FAILURE OF PLAN TO STATE SALMONID MEASURABLES OR KEY PERFORMANCE INDICATORS

#### Section 3.3.1 - Proposed Management Plan – Submission Item:

25) This submission considers that the plan, without baseline data is compromised, as its success, failure or progression cannot be quantified due to the absence of baseline data. In order to obtain baseline data it is suggested that the following actions be undertaken:

A) Cease all artificial stock manipulation by ceasing all stock management operations;

B) Cease all artificial stock manipulation by introduction of a mandatory catch and release policy for all species;

C) Implement habitat restoration and enhancement programs to bring salmonid spawning catchment to their maximum carrying capacity for salmonids;

D) Implement an aggressive program of water quality monitoring, improvement and remediation;

E) Clearly define parameters based on upon the previous actions to aid in establishing a timeline for stock baseline estimation;
# 3.4 FAILURE OF PLAN TO PROVIDE OUTLINE OF 'FUNDING' AND 'STAFFING' REQUIRED FOR IMPLEMENTATION

# Section 3.4 - Proposed Management Plan – Submission Item:

- 26) This submission proposes that It will be necessary for Inland Fisheries to detail precisely the resources, funding and staffing levels required for each High-Level Action in the plan and clarification is hereby requested, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.
- 27) It is hereby requested that Inland Fisheries Ireland clarifies if the full funding of €1,371,536 has been secured for the continuation of Long-Term Studies on the Western Lakes as outlined in IFI document IFI/2021/1-4562 and confirmation of the commencement and completion of the 4-year research programme, and that this information should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this or any future management plan.

# 3.5 ECONOMIC AND ECOLOGICAL DEFICIENCIES RELATED TO THE PLAN REGARDING THE MANAGEMENT OF PIKE – APPARENT OVER REACH OF THE PROPOSED PLAN

# Section 3.5 - Proposed Management Plan – Submission Item:

28) This submission suggests that certain Actions in the plan over-reach such as those related to pike and coarse fish, particularly in any consideration given to the removal of existing conservation bye-laws relating to those species, and therefore a detailed explanation outlining the scientific basis, justification and expected outcome for the ecology of the Western Lakes of such Actions based upon existing scientific research is requested, and should be provided to the public prior to the adoption of any management strategy on the Western Lakes in this, or any future management plan.

# 3.6 STRATEGIC ENVIRONMENTAL ASSESSMENT - NATURA IMPACT STATEMENT & APPROPRIATE ASSESSMENT

# Section 3.6 - Proposed Management Plan – Overarching Appropriate Assessment Submission Item:

29) It is proposed here that this entire submission and <u>all</u> appendices is given in full, to any <u>current or future</u> <u>consultant or external / internal persons</u> engaged in undertaking Appropriate Assessment Screening, Natura Impact Statements, Stage 2 Appropriate Assessments or Strategic Environmental Assessment Reports - related to the proposed "Long-term Management Plan for the Great Western Lakes", or any future Western Lakes management plan or project, where stock management is a proposed element of the plan or project on any of the Western Lakes.

# Section 3.6.2 - Proposed Management Plan – Submission Item:

30) This submission calls for an immediate investigation into who requested and authorised the revisions to the 'Actions' as per Section 11 of the 'Long Term Management Plan for the Western Lakes'; the basis (i.e. scientific or other) for the revisions; why INVAS Biosecurity Ltd. was not given the revised 'Actions' at the Appropriate Assessment Screening Stage and why Inland Fisheries Ireland with-held the Appropriate Assessment Screening Report at the outset of the public consultation process?

# Section 3.6.3 - Proposed Management Plan – Submission Item:

31) This submission considers that 'Actions' e.g. 5.2, 5.3, 7.1, 7.2 contained in the 'Long Term Management Plan for the Western Lakes' are not based on the *"best scientific knowledge in the field"* as per ECJ Case Law per NPWS (2009), but are instead *"data-gathering of relevance in assessing the likely effects"* and as such the impacts are uncertain and the Actions should be withdrawn until such a time that scientific research is complete.

# 3.7. TABLE OF SUBMISSION COMMENTS & PROPOSED AMENDMENT / ADDITIONS TO IFI PLAN 'ACTIONS'

32) This section contains a review of the Actions proposed in Inland Fisheries Ireland's 'Long Term Management Plan for the Western Lakes'.

The review is set out in 6no. columns as follows:

- Column 1 IFI High-Level Objective and relevant Action (See Page 45, 46 & 47 of the Plan)
- Column 2 Proposed IFI Action (See Page 45, 46 & 47 of the Plan)
- Column 3 General Submission Comment on IFI Action
- Column 4 Proposed Submission Amendment to IFI Action and/or Additional Proposed Action
- Columns 5 & 6 Start and Finish of Action

Please review the complete Section 3.7 within the Submission for a full list of the Actions and other comments.

# 4 FACTORS POTENTIALLY ADVERSELY AFFECTING THE INTEGRITY OF THE SITES CONCERNED

This submission considers that the 'Long Term Management Plan for the Western Lakes' has the potential to adversely affect the conservation objectives and overall ecology of the Natura 2000 sites, including their structure and function and as such are considered to have a 'Potentially Significant Effect'.

A number of 'Potentially Significant' environmental effects will also impact upon human health and the landscape.

It is proposed that each of the impact types reviewed in this section including the respective submission items are <u>fully incorporated</u>, and scientifically assessed by Inland Fisheries Ireland and/or any appointed consultants, during the preparation of Natura Impact Statements, Appropriate Assessments and the Environmental Report prepared in respect of the Strategic Environmental Assessment Scoping Report, <u>for this and any future Management Plans</u> <u>considered by Inland Fisheries Ireland</u>.

The impact types on the Natura 2000 sites are deemed to be described as follows:

- Water Quality and Resource;
- Loss of Habitat Area;
- Species Population Density;
- Potential Removal of Native Species;
- Disturbance;
- Population and Human Health;
- Landscape;

# 4.1 WATER QUALITY AND RESOURCE

# Section 4.1.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

33) It is proposed here that the Plan is re-drafted to reflect measures connected <u>specifically</u> to the agricultural sector regarding practices and land use, including measures implied by the Nitrates Directive, Habitats Directive, EU Water Framework Directive, and the Rural Environmental Protection Scheme for such lakes, rivers and tributaries within designated Special Areas of Conservation (SAC's), by introducing a suite of environmental actions, sampling analysis and compliance conformity, to expressly improve the ecology within the waters for the primary benefit of salmonids as implied by the Programme of Government 2020.

- 34) It is proposed here that the Plan is re-drafted to include a full risk analysis of all environmental stressors acting on the Western Lakes to include, but not limited to the following: agriculture, forestry, industry, domestic waste treatment, municipal water and waste treatment, land drainage, water extraction etc.
- 35) It is proposed here that Action 3.1 of the Plan is re-drafted to include for the redeployment of staff engaged in stock management to increased environmental detection and enforcement and that the Action 3.1 include for 1) retraining and upskilling of existing staff, and 2) increasing environmental officer numbers, if funding becomes available.
- 36) It is proposed here that in consideration of submission item.1 of this section, that a new additional Action 3.4 is inserted into the Plan to specifically propose engagement with Mayo County Council and the project partners of the EU financed LIFE Project, Lough Carra Life to include specific consultation with catchment management groups, with the sole purpose of building a suite of comparative Agri-environmental and climate measures options for each of the Western Lakes, based on the learnings of the LIFE Project.
- 37) It is proposed here that a new additional Action 3.6 is inserted into the Plan to specifically engage with EPA to seek elevation of Lough's Corrib, Conn, Cullin, Sheelin, Arrow, Carra & Mask to 'Priority Site' status to increase frequency within the Water Framework Directive of operational and surveillance programmes for physio-chemical, hydromorphological & biological quality elements on Lough's Corrib, Conn, Cullin, Sheelin, Arrow, Carra & Mask to reflect and assist upcoming research into fish stock dynamics.
- 38) It is proposed here that a new additional Action 3.7 is inserted into the Plan to specifically provide an 'Adaptive Management Programme' to scientifically research the link between water quality improvements and fish species responses in the Western Lakes and secure specific funding from DECC for enhanced ecological testing and monitoring to facilitate the programme.

# Section 4.1.2 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

- 39) It is proposed here that there is a considerable risk for environmental factors to continue adversely impacting on the environmental quality of the Natura 2000 sites and their salmonid species, and in this regard the consultant appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) should assess if the Plan adequately addresses this risk within the Actions proposed.
- 40) It is proposed here that Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, 7.2 which currently include measures associated with "stock management" on each of Western Lakes, are removed from the Plan and instead replaced with an appropriate suite of enforceable regulations designed to improve, protect and monitor the water environment in each of the Natura 2000 sites in response to water quality improvement.

# Section 4.1.3 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

- 41) It is proposed here that the consultant appointed to prepare the 'Natura Impact Statement' and the 'Appropriate Assessment' for the Plan considers the implications for the integrity of the EU Water Framework Directive in Ireland, of artificially manipulating fish stocks within the Natura 2000 sites and the uncertainty this action places on the three biological elements i.e. fish composition, abundance and age structure, subsequently to be used as indicators in Ireland's EU obligation to achieve a standard of "Good Water Quality" with regard to the named lakes.
- 42) It is proposed here that Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, 7.2 which currently include measures associated with "stock management" on each of Western Lakes, are removed from the Plan and instead replaced with an appropriate suite of enforceable regulations designed to improve, protect and monitor the water environment in each of the Natura 2000 sites in response to water quality improvement.
- 43) It is proposed that all future fish stock surveys carried out to satisfy Ireland's obligation with regard to the EU Water Framework Directive on the Western Lakes, are carried out based upon establishing the true impact of the prevailing water quality ecological drivers within the Lakes.

# 4.2 LOSS OF HABITAT AREA

# Section 4.2.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

- 44) It is proposed here that brown trout (salmo trutta) are not directly connected with, or necessary to the management of the Special Areas of Conservation, with potential adverse impact on Annex II species salmon (salmo salar), and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.
- 45) It is proposed here that farmed trout are not directly connected with or necessary to the management of the Special Areas of Conservation with potential adverse impact on Annex II species salmon (salmo salar), native or naturalised species and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

# Section 4.2.2 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

46) It is proposed here that there may be an adverse impact on Annex ii species salmon (salmo salar), directly related to an artificially induced increase in brown trout (salmo trutta) populations through competition for food and space on salmon spawning and nursery habitats in the SAC's and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

# 4.3 SPECIES POPULATION DENSITY

# Section 4.3.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

47) It is proposed here that the conservation limits for Atlantic salmon are reviewed in the context of all freshwater adverse impacts and that the brief of the consultant appointed should be extended to consider the weighting of all individual risks to include any risk associated with the Plan, and that this review be included in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

# Section 4.3.2 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

48) It is proposed here that the potential adverse impact on the ecology of the lakes in the Natura 2000 sites of removing fish species as part of "stock management plans" without clear scientific evidence of the functional effectiveness of such plans at the outset, are reviewed by the consultant appointed and that this review be included in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

# Section 4.3.3 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Item:

49) It is proposed here that there may be an adverse impact on red-listed endangered and vulnerable Mayflies (Ephemeroptera), directly related to an increase in brown trout (salmo trutta) as a consequence of the objectives of the 'Long Term Management Plan for the Western Lakes' and as such the consultant appointed should consider this risk in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# Section 4.3.4 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

- 50) It is proposed here that there may be an adverse impact on the ecology of the Natura 2000 sites if trout populations are artificially increased in the Special Areas of Conservation (SAC) by predating to an unknown extent upon Annex ii Salmon at the early life stages and as such, the potential adverse impact on salmon should be considered in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.
- 51) It is proposed here that the objective of artificially increasing the stocks of brown trout is removed from the 'Long Term Management Plan for the Western Lakes', instead focusing on the natural fish biomasses responding to water environment improvements, as artificially increasing trout may enhance potential risk from predation on salmon alevins, parr and smolts in the spawning and nursery rivers and streams by an increased brown trout (Salmo trutta) population, which may have an adverse impact on the conservation objectives on the Natura 2000 sites.

# Section 4.3.5 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

52) It is proposed here that all scientific research available regarding avian predation on Annex ii species Salmon be reviewed to include this potential adverse impact on Annex ii salmon in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

# Section 4.3.6 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

53) It is proposed here that there may be an adverse impact on the ecology of the Natura 2000 sites if "stock management plans" allow for pike to be removed from lake tributaries as a consequence of the 'Long Term Management Plan for the Western Lakes' without first considering if predation on salmon smolts is negligible based on smolt run patterns and the physical characteristics of the tributary, and as such the consultant appointed should consider this potential risk to the ecology of the lakes from the adoption of a generalised removal of pike in this instance, in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

54) It is proposed here that Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, 7.2, which currently include measures associated with "stock management" on each of Western Lakes, are removed from the 'Long Term Management Plan for the Western Lakes' pending a complete review of all of the best evidence based research and modelling available as per Action 2.3 of Inland Fisheries Ireland's Corporate Plan (2021-2025) by the appointed consultants in the preparation of the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the impact of the Plan in each of the Natura 2000 sites.

# 4.4 POTENTIAL REMOVAL OF NATIVE SPECIES (PIKE) FROM NATURA 2000 SITES

# Section 4.4.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

- 55) It is suggested that the removal of pike as a potentially native species based upon the best available scientific evidence, will have an adverse impact on the integrity of the Natura 2000 sites and as such, the native status of pike in the Western Lakes should be clarified with certainty within the context of the 'Long Term Management Plan for the Western Lakes' and that management of the species should cease on the basis of existing research and that this be considered in the preparation of the Strategic Environmental Assessment Report, the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.
- 56) It is suggested that the native status of perch is reviewed per the comments of Pedreschi & Mariani (2015) and that a scientific research study is undertaken by Inland Fisheries Ireland to examine the colonization of Ireland by perch and that the potential for this species to be native is assessed in the context of the 'Long Term Management Plan for the Western Lakes' in the preparation of the Strategic Environmental Assessment Report, the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 4.5 DISTURBANCE - IMPACT OF GILL NETS USED FOR STOCK MANAGEMENT IN NATURA 2000 SITES

### Section 4.5 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

57) It is proposed that the use of gill nets in each of the Western Lakes named in the 'Long Term Management Plan for the Western Lakes' may adversely impact on the Conservation Objectives of the Natura 2000 sites with regard to the disturbance of Annex ii Otters in SAC's and protected bird species in SPA's in the context of Plan where they are used to execute "stock management plans" and as such it is proposed that the use of gill nets should cease for the purpose of stock management in the Western Lakes, and that this is reviewed in the Strategic Environmental Assessment Report and by the consultant appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 4.6 POPULATION AND HUMAN HEALTH

# Section 4.6.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

58) Actions 4.4 & 5.3 of the 'Long Term Management Plan for the Western Lakes' specifically propose to 'encourage' and 'enable' one stakeholder group to remove and kill fish species of interest to other stakeholders, with the significant potential to further marginalise pike and coarse angling stakeholders on the Western Lakes, and as such it is proposed, on the grounds of 'Population and Human Health' that Actions 4.4 & 5.3 are assessed in the Strategic Environmental Assessment Report and by any consultant or body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

### Section 4.7.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

59) Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 of the 'Long Term Management Plan for the Western Lakes' are likely to have a significant impact upon the Western Lakes and the enjoyment and participation of angling by all angling disciplines, and as such it is proposed, on the grounds of 'Landscape' as an 'Environmental Component' of the Plan, that the 'Impact upon Areas of Special Amenity' of Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 are assessed in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

### Section 4.7.2 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

60) Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 of the 'Long Term Management Plan for the Western Lakes' are likely to lead to significant 'Adverse Visual Impacts' on the Western Lakes and as such it is proposed, on the grounds of 'Landscape' as an 'Environmental Component' of the Plan that the impact of the 'Occurrence of Adverse Visual Impacts' of Actions 4.1, 4.4, 4.5, 5.1, 5.2, 5.3 are assessed in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 5.1 SCIENTIFIC RESEARCH - EVIDENCE OF A REDUCED PREDATION IMPACT ON TROUT

# Section 5.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

61) It is proposed here that there may be an adverse impact on the ecology of the Natura 2000 sites contained in the 'Long Term Management Plan for the Western Lakes', should the dominance of roach found in recent pike diet research not be assessed in the context of proposing a "stock management plan" for each of the Natura 2000 sites and as such, this should be reviewed specifically for each Natura 2000 site in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 5.2 SALMONID CONSERVATION – THE IMPACT OF PREDATOR REMOVAL ON TROUT IN MODIFIED LAKES

### Section 5.2 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

62) It is proposed here that there may be an adverse impact on the ecology of the Natura 2000 sites contained in the 'Long Term Management Plan for the Western Lakes', by removing predators from Natura sites where there are ongoing anthropogenic pressures and as such, this should be reviewed specifically for each Natura 2000 site in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 5.3 SCIENTIFIC RESEARCH – POSSIBLE CO-EXISTENCE OF PIKE AND TROUT IN LARGE WELL-CONNECTED LAKES

### Section 5.3 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

63) It is proposed here that there may be the potential for adverse impacts on the ecology of the Natura 2000 sites by removing pike from sites where the best evidence based research and population modelling by Inland fisheries Ireland's own published research acknowledges the potential for co-existence of pike and trout, and therefore the co-existence potential based upon the best available scientific evidence should be reviewed in the Strategic Environmental Assessment Report and by the consultant / body appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the 'Long Term Management Plan for the Western Lakes'.

### Section 5.3.1 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

64) It is proposed here that there may be the potential for the ecology of Natura 2000 sites to be naturally altered by bird-mediated modes of dispersal of fish species, the potential of which may be elevated on or near to Special Protection Areas, and as such the potential for the natural dispersal of fish species and all available published research should be reviewed by the consultant / body appointed to prepare the Natura Impact Statement (NIS), the Appropriate Assessment (AA) and Strategic Environmental Assessment Reports regarding any management decisions taken that are relevant to the 'Long Term Management Plan for the Western Lakes' or to any future management plans.

# 5.4 TROUT AND PIKE FISHERY – SCIENTIFICALLY EVALUATED MANAGEMENT OPTIONS

# Section 5.4 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

65) It is proposed here that 'Scientifically Evaluated Management Options' aligned to Section 2.3 of Inland Fisheries Ireland's Corporate Plan, and based upon the modelling of alternative prey available for pike, should be prepared for each of the Lakes named in the 'Long Term Management Plan for the Western Lakes' prior to any decision taken to introduce "stock management plans" under Actions 4.1, 4.4, 5.1, 5.2, 5.3, 5.4, 7.2 and that the adverse impact or uncertainty of any option should be reviewed using ecologically sound scientific evidence within the Strategic Environmental Report, and by the consultant appointed to prepare the Natura Impact Statement (NIS) and the Appropriate Assessment (AA) regarding the Plan.

# 6 REFERENCE TO INLAND FISHERIES IRELAND – REVIEW OF POLICY (2018) – MANAGEMENT OF PIKE IN DESIGNATED WILD BROWN TROUT FISHERIES

# Section 6 - Proposed Management Plan – SEA (NIS/AA) & IFI Submission Items:

It is proposed here that prior to approval or otherwise for any action in the 'Long Term Management Plan for the Western Lakes' by the DECC, that Inland Fisheries Ireland clarifies the following:

- a) Has Inland Fisheries Ireland considered the recommendations of the Pike Policy Review Group during the deliberations undertaken for the Plan?
- b) Which recommendations of the Pike Policy Review Group have been inserted into the Plan?
- c) Do the authors of the 'Long Term Management Plan for the Western Lakes' believe the Plan aligns with IFI's Corporate Governance systems and procedures, and how was that undertaken at a) conceptual stage, and in b) the drafting of the Plan?
- Provide a scientific report by the Research Division detailing how each Action in the Plan is based on the best evidence-based research and modelling available, as per Action 2.3 of Inland Fisheries Ireland's Corporate Plan (2021-2023);
- e) Provide details of the resources and funding required for each Action of the Plan, as per Page 8, paragraph3 of the Plan;
- Provide details of the funding source for each individual Action in the Plan and provide confirmation if funding in principal has been secured for each;
- g) Provide definitive details and the metrics to be used to show of how Inland Fisheries Ireland intends to measure improvements or otherwise, in each of the Western Lakes;
- h) Provide definitive details of the measurable goals / KPI's of the Plan for each of the Lakes in terms of each fish species and the frequency of those KPI's;

# Appendix E

Further Information Related to the Native Status of Irish Species

(Correspondence with Inland Fisheries Ireland CEO)





Francis O Donnell, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin, D24 CK66, Ireland.

Paul Byrne, IPS Secretary, 21 Kilcarberry Business Park, Grangecastle, Dublin 22

Date: 03rd Apr 2022

# **REF: Pike Origins & Historical References**

Dear Francis,

I would like to formally address some of the commentary at recent ACCI meetings relating to pike scientific studies, specifically concerning pike diet and anecdotal references to Irish pike origins. I would like to comment on the Irish Pike origins issues within this communication.

# Irish Pike Origins

During the ACCI meeting of 21 December 2021, it was suggested by you as IFI CEO that the absence of a reference to pike in a historical document (West or H-Iar Connaught ,Roderic O'Flaherty, 1684) may require consideration in relation to providing a basis for a claim that pike did not exist in Lough Corrib or Lough Mask prior to 1672.

There are numerous historical references to pike in Ireland that have been further examined in the past 20 years. We have taken the opportunity to comment on some of these in this communication to draw your attention to them.

Additionally, the current advances in scientific research based on microsatellite DNA supports the contention that Ireland has its own largely widespread genetically distinct strain of pike dating back somewhere between 4000 and 8000 years and for which, a process of natural colonisation of Ireland is strongly supported. This research was undertaken by collaboration between UCD and Inland Fisheries Ireland, who had recently signed a MOU to support this type of ground-breaking research. Furthermore, the recent pike policy review group set up in 2017 and chaired by Mr. Sean Long (IFI) was specifically advised by Dr. Debbie Pedreschi, lead researcher of the microsatellite DNA based published paper, that she had carried out further genomic research using Single Nucleotide Polymorphisms (SNPs) and had thus far concluded that the results of the original research are supported by the SNPs findings. Dr. Pedreschi stated during her presentation to the pike policy review group that based upon the current data, *"pike are as likely / more likely to be native per the available data"* – Please see page 4 of "The Management of Pike in Designated Wild Brown Trout Fisheries Policy Review Report - December 2018".

Considering the current findings of scientific research and the subsequent additional genomic research based upon SNP's, we would concur with Dr. Pedreschi that *"this information is significant for the reappraisal of current management strategies in this economically (angling) and ecologically (top-predator) important species"*.

For the purpose of this communication, a number of relevant historical records and recent findings have been examined to illustrate the likely misconceptions derived from attaching management strategies to historical records:





# 1) Evidence of Pike in Lough Corrib Pre-Roderic O'Flaherty, 1684:

<u>Evidence relating to the presence of a harvestable stock of pike in Lough Corrib existed over two decades</u> <u>prior to the written works of Roderic O Flaherty and was established by Hardiman through historical</u> <u>records.</u> Please see highlighted section of 'The History of Galway Town, Hardiman, 1820 contained in this communication.

This record refers the grant of fishing rights of and in the river of Galway including that of "pike" to Sir George Preston, dated 27<sup>th</sup> July 1663. Prior to this, on 28<sup>th</sup> April 1657, the salmon and "all other fishings of the river" were let to Mr. Paul Dodde "for one year for the interest of the state". It is therefore entirely inconceivable that the species to which the rights applied over the period would be speculative and therefore would not have specifically included "pike", if pike did not already inhabit this water.

This knowledge is of considerable importance when one considers that Ireland already had an export trade for pike dating back to the end of the 15<sup>th</sup> century and from an economic perspective would be of considerable importance to any holder of the fishing rights, no less so than rights held to this current day on fisheries throughout Ireland.

As the reference to Roderic O Flaherty was raised by the IFI CEO we request that the reference cited by Hardiman similarly be communicated by the IFI CEO to the wider ACCI group. For context this should include its basis and most importantly the information that the reference pre dates Roderic O Flaherty's anecdotal claim by over two decades.

Further to Hardiman's reference it should be noted that pikes indigenous status is referenced by one of the oldest trout angling clubs on Lough Corrib, Oughterard Angler & Boatmans Association. "Pike are indigenous to Lough Corrib itself, but not to this river or the spawning lakes upstream."

# 2) Evidence of Export of Pike from Ireland in the 15<sup>th</sup> Century - Support of Ireland's Indigenous Pike Stocks:

During the 15<sup>th</sup> and 16<sup>th</sup> centuries, there was a thriving export business of pike from Youghal to Billingsgate as documented in AK Longfeld's "Anglo Irish Trade". Please see highlighted section of 'The History of Galway Town, Hardiman, 1820 contained in this communication.

Pedreschi et al. 2013 revealed the genetic diversity in Irish pike populations and found that genetic evidence suggests pike may have colonised Ireland in two waves, one in 4000-8000bp and a second later strain in 1000bp. As this evidence suggests that that the colonisation in the South of the country was much later than the 15<sup>th</sup> century, then it is reasonable to suggest that a pike harvest worthy of export would have had to originate from the Midlands and West of Ireland and that any fishing rights issued would be cognisant of the economic importance of correctly naming the species on individual fisheries to which rights apply, as is the case for Sir George Preston, dated 27th July 1663 on the river of Galway and the connected Lough Corrib, and whose grant was then further confirmed by patent six years later. There is no evidence provided to suggest that the patent differed from the grant of fishing rights or that any species had been removed from the grant as not-existing.





# 3) Evidence and Comment for Previously Unknown Fish Stocks in Irish Waters:

Roderic O' Flaherty will not have based his opinion on the existence of pike stocks upon any scientific survey methodology and his paper does not indicate how his opinion about pike is supported. This point is significant.

Interestingly, his paper suggests the existence of Rudd, though he calls them 'Roche' and refers to other unnamed species as "the like of no value", though he doesn't describe further, the species to which he refers. Rudd shoals can be found very close to shore and in shoals so perhaps this led to the easy capture and recognition of Rudd. It is most interesting that this cyprinid species already existed in Lough Corrib and that its mode of introduction didn't warrant mention. We know that Rudd remains found in County Antrim date back to the iron age (Ref: Barbe & Garrett investigation contained in this communication) and therefore it may be of no surprise that Rudd are and likely were at that time, a widespread Irish species.

Roderic O Flaherty's paper does not provide any supporting evidence for his opinion that pike did not exist. However, absence of evidence is not evidence of absence. For example, Pollan, apparently a species endemic to Ireland were not discovered in Lough Allen until 2007. This would have been despite Pollan engaging in very noticeable shallow water spawning activity for thousands of years!

The question of how Inland Fisheries Ireland views new species found where they were thought not to exist previously, is something that must be considered. The appearance of pollan on Lough Allen did not lead to claims of anthropogenic transfer, yet the appearance of perch, pike or other species where they apparently do not exist previously, inspires unsubstantiated claims in the press and social media of anthropogenic fish movement and legal action, without any apparent consideration of the non-anthropogenic vectors for such movement i.e. by natural means. Numerous scientific authors have researched avian vectors for the movement of fish species.

As such, there is need for wider consideration of the natural vectors leading to the translocation of fish species between water bodies in Irish waters, rather than by selecting an arbitrary point in time beyond which the appearance of new species either by natural or anthropogenic means, leads to species management. In any event, our understanding is that Inland Fisheries Ireland has not established a clear ecologically based point in time that could be confidently used to set the time limits of when fish species could be considered native for Ireland. However, what we do know is that Inland Fisheries Ireland continues to engage in management operations that negatively impact upon a pike strain for which current genetic evidence suggests is likely a native strain representing pike that may have reached Ireland naturally 8000 years ago.

# 4) Anthropogenic Impact on Habitat & Water Quality – The Real Issues!

A small sample of historical records is included with this communication which clearly illustrate that before the effects of arterial drainage and other anthropogenic pressures, angling for trout was excellent (producing bags of 30 to 40 fish per day per angler), while pike angling was similarly excellent (producing numerous fish to over 30lbs regularly).

The reality is that the future quality of salmonid species will only be secured by calling out and addressing all environmental, spawning habitat and water quality issues affecting the 'Western Lakes' group and lakes and rivers across Ireland.





All other effort expended on artificial manipulation of fish species will ultimately fail salmonid species and the anglers who fish for them. Until this fact is accepted, Inland Fisheries Ireland are failing the salmonid organisations. One only has to acknowledge the anthropogenic pressures the 'Western Lakes' group have endured over many decades and continue to endure e.g. Lough Carra, to understand the real issues!

Please see the following articles extracts contained in this communication - 'Article (Circa 1945) Referenced on Mayo.ie', 'The Angling Excursions of Gregory Greendrake, 1834', 'William Bilton, The Angler in Country Clare, 1833'.

5) The application of genomic microsatellite DNA to establish the native status of an Irish species is not new.

The National Frog Survey of Ireland 2010/11 undertaken by the National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht in the following extract from the report, stated:

"The origins of frogs in Ireland have been controversial, with early suggestions that they were not native but were introduced from Britain in the 17th century (Smith, 1964). However, genetic studies indicate the existence of two distinct clades (Teacher et al., 2009), one similar to that found in Britain and a second, distinct group unique to the south-west of Ireland. These results imply two separate colonization events, probably both in the early postglacial period, one from the east and one from a Lusitanian refuge in or near county Kerry. Similar results have been found for the natterjack toad (Rowe et al, 2006). It is, therefore, considered that the common frog is a longstanding native of Ireland".

The only conclusion to be drawn by comparing frogs and pike in regard to applying a native status is that pike have become the subject of local and political pressure in certain Irish communities and a negative viewpoint is being driven by a very vocal minority, whereas frogs have benefitted from the same genetic research.

This was clearly evident during the recent pike policy review, whereby politics trumped scientific evidence and whereby the review process itself, and the recommendations drafted by the review group, was allowed to be drawn off course and manipulated by the attempted forceful introduction of a disgraceful pike byelaw on the 'Western Lakes' by Minister Sean Kyne of County Galway, on his direction to the Inland Fisheries Section of his department.

The following snapshot was taken from the Inland Fisheries Ireland website. This is more factual than basing management strategies on the opinion of Roderic O'Flaherty, 1684.







### The History of Galway Town, Hardiman, 1820: 1 of 1

#### HISTORY OF GALWAY.

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### IV. FISHERIES OF THE RIVER AND BAY.

### 1. Salmon Fishery.

Amongst the many natural advantages of which Galway and the surrounding district can boast, the fishings of the bay and river are not the least considerable. The salmon fishery is one of the most valuable in the kingdom,' and from a very early period has been a source of combinatent. In 1753 the weirs were leased for 20 years, at 150% a year. In 1776 and 1790 they brought 200% yearly, but at the latter period they were worth considerably more : since 1800 they frequently produced upwards of 500% a year, having increased in value in conse-

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### Oughterard Anglers & Boatmans Association (website) 1 of 1







### Barbe & Garrett: 1 of 9

#### THE PIKE IN IRELAND : A (NECESSARY) REVIEW

#### Part I: Liús

The Dutch Angling journalist Jan Schreiner is widely regarded as one of the most influential writers of the 20<sup>th</sup> century. He wrote over 50 books about all kinds of angling and contributed to several angling magazines. After World War II he started writing about the joys and pleasure of fishing, a pastime up to then only known for food supply reasons. Most importantly, his writings lay the foundations for a general belief and acceptance that catch-and-release fishing is a very important aspect, necessary to protect our sport, given the increased pressure of pollution, over fishing etc...

Jan Schreiner was a frequent visitor to the island of Ireland. He loved the country and spent many weeks fishing for salmon, trout, pike, perch, tench, bream etc. He was, and still is, well known, in the Foxford area in particular. In 1973 he wrote "Sport fishing in Ireland", another great example of his fabulous and highly poetic writing style. Yet, when it came to the management of Irish waters, he could be very critical. In this book he spends some time explaining the attitude of the Irish fisheries towards pike. He didn't give them many compliments...Probably the single most important statement in this context was the following : " It would be very interesting if someone someday would dig into all the accepted facts which, despite their very poor foundations, are still generally accepted as truths." A clear allusion to the theories held on by the Irish Fisheries that pike is not a native species and has to be culled on trout waters.

During the gillnetting campaign carried out by the Western Regional Fisheries Board on Loughs Mask, Corrib and Carra in winter 98 and spring 99 a passionate debate took place in the local and national press. One contributor wrote the following in one of his letters : "...pike, a piscovore whose Irish name is 'Gaill Eise' or foreign fish... should therefore be removed from these lakes..." A short while later I was told by an Irish speaking person living in the Gealtacht that this was incorrect since the Irish for pike was 'liús'.

Since then, my good friend Shane Garrett and I, together with the help of numerous very kind and helpful people, have gone through piles of information and documents, in order to puzzle together the history of Irish pike. We have also focused on arguments brought forward by Irish Fisheries Scientists claiming that pike are of recent introduction. More than one year later and although our work is far from finished, we would like to share our finds, to date, with the interested reader. Indeed, we came across a number of very interesting references.

Let's first of all solve the "gaill iasc – liús" problem. Open any Irish dictionary and you'll see pike being translated as liús. Some dictionaries however mention gaill iasc as well. It appears that gaill iasc is a literary coinage, a creation from the 17<sup>th</sup> or 18th century. The original word for pike, liús, is much older. Although it is impossible to pinpoint exactly when it was first used it appears that liús dates from somewhere between the 13<sup>th</sup> and the 15<sup>th</sup> century, indicating that pike could very well have been on this island much longer than we were always led to believe...





### Barbe & Garrett: 2 of 9

The Irish Fisheries have always seen the gaill iase theory as a solid base to prove their introduction theory. They have scaled down this theory to the belief that gaill iase is the Irish word for pike used in some parts of West Mayo. Incorrect again, I'm afraid. In The Irish naturalists Journal, Volume 8, 1942-46, an article "Local names of Irish Fishes" by G.P. Farran is published which mentions Liús for Mayo. Not a mention of gaill iase. Together with this argument it is often said that pike cannot be native because there are lakes where pike are absent. It appears to me that it is very difficult to defend this argument. There are numerous lakes where no trout or salmon can be found but do we see them therefore as introduced?

Besides; to say that gaill iasc means foreign fish is in itself all too simplistic and incomplete. Whilst iasc means undoubtedly fish, gaill can mean foreign but can also mean "foreigners-" or "Gaul" or "Norseman". The word gaill iasc therefore does not prove at all that pike is an introduced fish species.

Another argument of the introduction theory is that there is no old Irish name for pike. Unlike for species like salmon and trout which both have old Irish names. Sounds solid at first sight but doesn't make sense either I'm afraid. Let's give our salty friend the mackerel a thought. Or the cod maybe. I think everyone will agree that these are native species to the Irish coasts. Yet, they have no old Irish names! One could also look at our feathered friends and notice that a bird like the partridge has no old Irish name, yet is native to this country. In other words, the fact that pike has no old Irish name does not prove anything. Surely not that it is introduced.

Our "find" of the word Liús has proven very important since. The word keeps coming back in different publications and references and it will prove to be very significant indeed as these series of the highly interesting journeys along the history of Irish pike unfolds.

So far for the introduction. In the next article we bring Dr. Went upon stage, and then it gets really interesting!

Text : Frank Barbé and Shane Garrett





### Barbe & Garrett: 3 of 9

#### THE PIKE IN IRELAND : A (NECESSARY) REVIEW

#### Part 2 : Went

In 1957 Arthur E.J. Went wrote "The Pike in Ireland". It was published in The Irish Naturalists' Journal. I can recommend the reading of these journals to anyone with an interest in the history of Irish nature and wildlife. A winter's evening by the open fire, fueled with a glass of your favorite drink becomes a real treat when reading through these Journals.

Went was a noted historian who wrote several articles about Irish fish. In the above mentioned publication Went came to the conclusion that "...it would certainly appear that it (the pike that is) is not a native fish." To come to this belief Went sums up a number of references and it has been extremely interesting to look into these in detail. It is important to point out that Went's work is still the main foundation of the pike's introduction theory held on to by the Irish Fisheries.

Part of his introduction theory relies on the absence of an old Irish name for pike. Went also writes that " the more modern name for pike is gailliasc, which literally means strange or foreign fish." In the first article we have shown that both conclusions are incorrect.

It is of extreme importance to note that Went did not investigate the Irish word Liús (meaning pike and presumably dating from somewhere between the 13<sup>th</sup> and 15<sup>th</sup> century.). The word Liús appeared several times in articles published in The Irish Naturalists' Journal written by other contributors. It seems highly unlikely that Went did not read these, as he had articles himself in some of these Journals. Did Went ignore "Liús"? If so, why?

We come to the heart of Went's introduction theory when he brings up his key witness. Giraldus Cambrensis. Giraldus Cambrensis was a Welsh archdeacon who visited Ireland on two occasions at the end of the twelfth century. He wrote the "Topography of Ireland". Went quotes Cambrensis in his article as follows :

... The rivers and the lakes are rich in fish peculiar to themselves, and especially in fish of three kinds, namely, salmon, trout and mud-eels. ... But some fine fish are wanting. I mean pike, perch, roach, gardon and gudgeon. Minnow, loach, bullheads, verones, and nearly all that do not have their seminal origin in tidal rivers are absent also."

Now let's have a look at the original translation of Cambrensis' writing. I quote from the same passage.

"The rivers and the lakes are rich in fish peculiar to themselves, and especially in fish of three kinds, namely, salmon, trout, and mud-eels. But some fine fish, found in other regions, and some magnificent fresh-water fish are wanting. I mean pike, perch, roach, gardon and gudgeon. Minnow, loach, bullheads, verones, and nearly all that do not have their seminal origin in tidal rivers are absent also."

The underlined part of the latter quotation was omitted by Went in his article. I have to stress on the extreme importance of this "mistake" in Went's work. We know that Cambrensis was in parts of the Southeast of the country and he might have travelled inland. When Cambrensis wrote "...found in other regions...", did he mean there was pike etc. in other parts of the country? Why did Went omit this vital passage?





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This patent misquotation by Went is the point of discussion here. However, Cambrensis' work should not be given more credit than it deserves. Indeed, some academics have their doubts about the value of Cambrensis' work. One of the reasons being the way in which he described Ireland :

"On the whole the land is low-lying on all sides and along the coast; but towards the centre it rises up very high to many hills and even high mountains.

" We all know that it is just the other way around. Mountains around the coastline (Wicklow-Kerry-Connemara...) and flat in the Midlands. This mistake of his is sufficient to conclude that he did not see great parts of the country. Cambrensis also gave accounts of "a fish with three gold teeth" and "a man that was half an ox". Up to today Giraldus Cambrensis is still regarded as a reliable witness by the Irish Fisheries.

Reading on in Went's article we come across the following passage :

"...we find in A.K. Longfield's 'Anglo-Irish trade' in the 16<sup>+</sup> century that pike were exported in the early part of that century to some of the smaller towns in the south of England. We do not know, of course, the origin of these fish."

Let's quote from A.K. Longfield's 'Anglo-Irish trade'direct now :

At the end of the fifteenth century and beginning of the sixteenth, however, they (this is the pike) appear as coming regularly from Youghal, Dungarvan, Cork and Kinsale to the Cornish ports..."

Three important observations can be made here. Firstly, why did Went question the origin of these Irish pike, exported to England? Whereas it says clearly, in the book where he refers to, that they came from several named Irish towns.

Secondly, Longfield mentions the export of pike to England from Ireland at the end of the fifteenth century. Further in the same book we even find a detailed reference of export of pike from Ireland to England in 1492. Why does Went ignore these pre-sixteenth century references to pike?

Thirdly, if there was a thriving trade of pike in Ireland at the end of the fifteenth century they must have been pretty widespread by then and could hardly have been introduced recently. (If introduced at all!)

Went's article "The Pike in Ireland" contains more references to support his introduction theory. Some of them relate to personal notes of individuals which therefore cannot be looked into. Others still need verification. Yet, it is clear that his work contains serious shortcomings.

And there is something else. Which is, again, of major importance. Arthur E.J. Went worked for the Fisheries Branch of the Department of Agriculture and was a founding trustee of the Salmon Research Trust. People who knew him testify that he was a very dedicated game angler who had no great regards for the fish species called pike. I am told that the latter statement is a very attenuated expression of his feelings towards pike. This gives rise to a serious conflict of interest. With this knowledge in mind, how could (and still can) this study of the Irish pike be the main foundation of the Irish Fisheries' policy towards pike?

Considering the evidence of shortcomings in his work and the obvious conflict of interests should we regard Dr. Went as a reliable source?

In the next article we will loosen some more bricks in the "introduction-wall" the Irish Fisheries have built over the last century as we will make the single most important revelation in our series on the history of pike so far...

Text : Frank Barbé and Shane Garrett





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### THE PIKE IN IRELAND : A (NECESSARY) REVIEW

#### Part 3 : Of Pike and Poets

Before getting to the heart of our third article on the history of pike in Ireland we need to clarify an often held misunderstanding. There is no concrete evidence to suggest that pike are an introduced species in Ireland. The introduction theory is based on references that have been regarded over the last century by the Irish Fisheries as conclusive. This is only a theory. In our first two articles we have shown that some of those references are incomplete, incorrect or even misleading. Others we regard as naïve and surely not conclusive enough to classify pike as introduced. One example...

Around 1900 a commercial fisherman on Lough Conn catches a fish which he cannot recognize. Subsequently it is identified as a pike. This incident is one of the reasons why the current Research Department of the Central Fisheries regard pike as introduced. When reading the "Doomsday Book of Mammoth Pike" by Fred Buller, one comes across several specimen pike caught on Lough Conn dating back as far as 1870. (One such specimen is currently on display in the Natural History Museum in Dublin.) In other words, at a time when our commercial fisherman caught the fish he could not identify, other people were claiming 40 and 50-pounders from the same lake! Clearly, pike must have been around for quiet a while if the lake was able to produce such monster fish. The fish determination skills from our friend seem to be in line with the science the Fisheries are serving us.

Let's conclude with a noteworthy passage from the same book :

Lough Conn, whose big pike and big trout once attracted a certain type of fisherman (the big-fish man) from all over Europe, now caters to those who are content to take a more certain bag of smaller fish (trout). This change is due principally to the systematic destruction of pike." The book was written in 1979.

Let's move on and look into another reference on which the introduction theory is based. We quote from a letter we received from Mr. P. Fitzmaurice, Director of Research of the Central Fisheries : "A review of historical Irish annals carried out in the 1950's found no reference to pike in any documentation prior to the 15<sup>th</sup> Century."

We presume Mr. Fitzmaurice refers to the article "The Pike in Ireland" written by Arthur E.J. Went in 1957. We dealt with Went and the contents of his work in our second article. However, apart from proving that Went's work was incomplete and parts of it incorrect, we also discovered a few more interesting facts that prove Mr. Fitzmaurice's quote highly doubtful.

"Regimen na Sláinte" is a medical text from c. 1420 which contains references to pike. It is an Irish translation of a Latin medical tract which originated in Italy. Interesting to note is that the person who translated the text (in the early 15<sup>th</sup> century) used the Irish word liús for pike, rather than merely transliterating the Latin lucius. It appears that the Irish translator was already familiar with the Irish word for pike. Since the original Latin text of this work was written in Italy, the references to pike are not directly relevant to the presence or absence of the fish in Ireland. However, the fact that the Irish translator knew of an Irish word for pike seems proof to us that the fish species occurred in Ireland early 15<sup>th</sup> Century.





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For the sceptical ones among us we will back up this theory and take it one step further.

The Irish Grammatical Tracts are a collection of rules of grammar and diction which assisted student poets in learning their craft. We will quote one such short poem which was written ca 1400 :

"do sgoilt giolla gég don ghiús

do bhrég liús na Sionna suas."

It was Chinese to us as well so we got the experts to translate it for us. The translation sounds as follows :

"The young man split a branch of the fir-tree,

he enticed up the pike of the Shannon."

This poem brings us the confirmation that there was indeed pike in Ireland, more precisely in the Shannon, ca 1400 and that no one found this remarkable. That no one found this remarkable leads us to conclude that they were there for quiet a while. It is tempting to draw further conclusions considering the hundreds of kilometers the Shannon covers and the numerous big and small lakes it connects.

The importance of the two above mentioned references taken into account we can rest assured that the claim that there was no (reference to) pike in Ireland before the 15<sup>th</sup> Century is outdated and incorrect. After all, the review the current Research Department of the Irish Fisheries base themselves on dates from the middle of the 20<sup>th</sup> Century...

In our final article we come to the conclusion of our series on the history of pike in Ireland. We will approach the pike's history from a few other angles, and bring up a few sources which consider the pike as being native to the Irish country...

Text : Frank Barbé and Shane Garrett





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### THE PIKE IN IRELAND : A NECESSARY REVIEW

### Part 4 : The Esox-Files Conclusions

With this article, we come to the conclusion of our series on the history of pike in Ireland. We should add however that we are currently preparing a special appendix to our story, in which we will focus on conservation. As our research into this intriguing subject has become an ongoing process, updates can be expected. Before we start drawing conclusions about the significance of the contents of our articles, we will first of all look at the pike's history in Ireland from a few other angles.

#### Native or not?

Although it seems almost sure that pike have spread in certain parts of the island later than in others, nobody has ever provided concrete evidence of its introduction. Indeed, some sources claim pike as being native. In 1950 Robert Lloyd Praeger wrote "The Natural History of Ireland", in which he classifies the pike as an Irish native fish species. One hundred years before that, William Thomson notes pike as being native. Aodh Mac Domhnaill from County Meath wrote a tract on natural history in the same period. Pike is the first fish he mentions as being native. He describes it as "clean, bright and tasty". We know from our last article that pike are proven to be in Ireland over 400 years before that. However, it is still very interesting to see that the pike was an established part of the piscine fauna in Co. Meath in the early 19<sup>th</sup> century and was not referred to as being introduced but classified native.

#### Other species in other countries.

In our research we have not limited ourselves to Ireland alone. We have looked around Europe and came across several interesting "incidents" which give hope of unraveling the pike's history here. Our first stop is Spain and we meet two old friends; Arthur Went and Giraldus Cambrensis. The latter was referred to in a publication of The Irish Naturalist' Journal written by Arthur Went in 1949. Went relies on Cambrensis' knowledge but as we already know, both are not "the perfect example of a reliable witness"! Went quotes Cambrensis' who claimed that "no part of Spain produces pike". A cave painting of a pike in Northern Spain drawn in the Stone Ages proves that they were not introduced and that once again Cambrensis and Went had it wrong.

Next we go to Holland where in the 20<sup>th</sup> Century a discussion took place whether the catfish was an indigenous species that should be protected or whether it was introduced in the late medieval period by monks. It was only in 1979 that fish remains from a number of prehistoric settlements were identified. It appeared that catfish were present in The Netherlands some 4000 years BC. The poor monk who allegedly wobbled his way with laden bucket to the Dutch waterside was innocent...

Closer to home we arrive in England where the tench has been regarded as an introduced species. Tench is a warm water fish which could not have survived the iceage, allegedly. Recent excavations in Suffolk carried out by the Time Team found not only pike but also tench remains. They were some 400,000 years old! Tench may now be regarded as native over there.

Our trip around Europe brings us home again and even here we can serve you a prefect example of how theories are only theories. The rudd is often classified as an introduced fish species to Irish waters for reasons similar to the English tench. Until





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rudd remains popped up in excavations carried out in Portbraddan Cave in Co. Antrim. This find dates from the first half of the 20<sup>th</sup> Century and puts the presence of rudd in Ireland back to the Iron Age.

We thought it was important to quote these different examples. If only to warn the readers not to pass out if tomorrow pike remains of a couple of thousand years old are found in Ireland. Stranger things have happened...

Some conclusions

Several conclusions can be drawn taking into account the pike's turbulent recent history in Ireland. The first one should be that there is much more work to be done and many more references to be looked into. Numerous people in libraries and universities have told us that there is much more interesting information "out there".

Archaeologists have hardly begun looking into the possible presence of fish remains in excavation sites. Understandably, human artifacts and tidal settlements have always carried the prime interest. Having said that it is very encouraging to see that Aidan O'Sullivan who heads the archaeological Discovery Programme takes a great interest in Lake Settlement. Hopefully they'll think of us when they find a few fish bones!

Derived from this first conclusion we must focus on the Irish Fisheries and the work they have carried out so far in this context. During this series on the history of pike in Ireland and its alleged introduction we have proven clearly on numerous occasions that there is something wrong with the introduction theory. It is not sure at all that pike are introduced and numerous references on which they have built this theory are doubtful, incomplete and even wrong.

This leads to our main conclusion. In one year's research we have found more about the pike's history than the Irish Fisheries did in half a century. Whilst we are surely very dedicated in what we are doing, we are not scientists and do not have for example regular access to National Libraries and Museums. Everything had to happen in our spare time and living in two different countries surely didn't make it easier for us. The Fisheries have their own team of scientists, even their own Research Department. If they didn't manage to find in 50 years what we found in one year then there is something wrong with their ability to carry out their job. If they did know all this but never told anyone and kept building their policies on the introduction theory then there is surely reason for drastic change. It is our opinion however that hardly anyone ever looked for the truth and the few people who did always looked hoping to find nothing. The case against the pike should be dropped on the grounds of lack of evidence. There should be an official review on the pike's history and the cessation of all discriminatory measures against pike until such review is complete. We cannot stress enough the extreme importance of an Independent team of scientists to carry out such research. For far too long, the Irish Fisheries have played witness, judge and jury on their own actions. This cannot be tolerated any longer. More than this an official inquiry into this (and other) mishaps in the Irish Fisheries is needed. We hear that an official inquiry is on the agenda in the North, not the least thanks to Angling Ireland Editor Frank Quigley. Is he up for another battle here down south? We see a very important role here for the angling clubs in Ireland. It is refreshing to see the rapid development of the Irish Pike Society and our hopes lie with them.





### Barbe & Garrett: 9 of 9

#### Request

Before rounding off we would like to ask anyone who thinks he or she might have interesting information or stories to add to our research to come forward and help us with our quest. Any bit of information, however small it is, is welcome to help complete the puzzle. We can be contacted via email at <u>lius@infonie.fr</u>

#### Acknowledgement

Summing up a list of all the people who helped us in compiling these articles would force us to write another article! This would lead us too far so everyone who knows he or she contributed is kindly thanked. We wish however to make two exceptions. First of all we would like to thank the Editor of Angling Ireland Frank Quigley who gave us space to show our findings. Anyone reading this should realize how lucky Ireland is, in having a fishing magazine that is not bowing to influential groups like advertisers, clubs or organizations regarding the contents of its articles.

Secondly we would like to mention and thank Nicholas Williams, Head Lecturer of The Irish Department, University College Dublin. He never tired of our requests for information, explanation and translation. He led us to numerous references and other people and without him this story would more than likely never have been written. We would like to finish by quoting Mr. Williams directly : "More research would, I am sure, yield more evidence that the pike is indigenous."...

Written by Frank Barbé and Shane Garrett







#### Article (Circa 1945) Referenced on Mayo.ie: 1 of 3







### Article (Circa 1945) Referenced on Mayo.ie: 2 of 3

Popular flies are: Invicta, Connemara Black, Claret & Jay, &, in Sept., Olive & Green, Golden Olive, Orange & Green & other dry Olive flies - all size 10.

Salmon are not nearly so plentiful as trout, but salmon-fishing is quite fair during May & first week of June. Ordinary salmon flies are suitable. Average weight, about 10 lbs. Pike & perch are very numerous in the lake & the former are obtainable up to 30 lbs. They (pike) are generally

caught on the troll. Fishing is entirely free on the lake. Cong (Ashford Castle & village). Accommodation at

Cong Angling Association members fish the northern portion of Loch Corrib. Chairman is Mr. Harry Harris,& Secretary is Mr. Micheal Ryan, both of Ryan's Hotel, Cong. Membership Fee: 2/6 per annum.

The Association holds an annual Trout-Angling Competition, Fly, on the Lake, usually 2nd week of May. Entrance fee for competition is 15/- & a size limit of 10" (12" recommended for 1946, but not decided) is imposed in respect of all fish caught. The Association recommends that a size limit be officially imposed by the authorities.

Lough Mask, nearest point of which is about 2 mls N.E. of Cong, 15 famous for the sporting gillarcos which it contains in great abundance. . These average somewhat smaller than Loch Corrib's trout & are caught mostly on the troll, but the number of fish caught in a day on Loch Mask is generally much greater than on the other lake. The trout rise very well to the wet flies, which are the same as those used on Loch Corrib. viz., Invicts, Connemara Black, Orange & Green, Cluret & Gay, Golden Glive, &, in Sept., other dry Glives - all bize 16;

the Yellow Wasp also is very good on L. Mask. The May-fly generally is on the rise about one week earlier than on L. Corrib, the first rise usually taking place about the 2nd week of May: it lasts for 3 to 4 weeks - during which catches of 20 to 30 fish per rod per day are not rare. This is the best season on the lake. The Baddy Longlegs is also

very effective at end of Aug. & during Sept. Brown Trout average about # 1b. Salmon are not very plentiful, though they are occasionall caught with the usual flies. Average, 10 lbs. Hest season for salmon is May/June.





### Article (Circa 1945) Referenced on Mayo.ie: 3 of 3

178/3/10(94) (40)ANGLING (Fresh Water) - Cont'd. There is very good pike fishing on L. Mask, as also for perch. Fishing is entirely free. Accommodation is available at Cong. Angling Club is a angling Club is at Bosts & bostmen are so numerous around Cong as to make the task of listing them very arduous. Besides, most of them have working agreements with the local Hotels, where bosts & bostmen may be engaged at 15/- (2 rods if desired) per day, plus bostmen's lunch. Ballinrobe. Cross River: This little river, which flows through Cross (Cong 3 mls) to Lough Corrib, affords really good fishing for trout, averaging 1 lb, though often much larger. Best seasom is early spring, when the ordinary river-flies are suitable. In June & July the wall-fly is effective. Fishing on this stream is free. Trout angling on Cross River would be greatly improved were the mouth cleared of the accusulated silt which chokes the passage of the water. Accommodation at Cong, 3 miles. Cong River & Pools in the neighbourhood: The visible flow of this river & Its shorter tributaries is only shout y ml. &, of this, the portion at Ashford Castle is preserved by Mr.Huggard, Ashford Castle Hotel. The stream contains <u>Brown Trout</u> &, in much smaller numbers, <u>Salmon, Pike & Perch</u>. Otherwise fishing is free & the river contains some trout weighing up to 5 lbs - averaging about 1 lb. Dest fishing is in the early spring, with ordinary river flies. In June-July the wall-fly is useful. This stream flows by the village, where accommodation is available. Numerous uprisings of the subterranean channels connecting Locks Mask & Corrib form big pools, sometimes miking small streams until they are swallowed up in the great caverns in the limestone rock. These may be fished for trout under similar conditions as on Cong Elver. All are free & several of these holes are found within y ml of the village. Ashford Castle Hotel Course (9-hole) - A small GOLFING: Ashrord Castle note: Course (9-noie) - A sami course, somewhat more than 2,000 yds long, but considered fairly sporting for its size. It is leid out on the old Deer Park, near the Castle, unidst lovely wooded surroundings on the M.E. shore of Loch Corrib. GOLFING:





### The Angling Excursions of Gregory Greendrake, 1834: 1 of 1

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Wieklow. A material source of the good angler's pleasure is to watch nature, catch her, in the shape of a fly, on the wing, and work artificially upon the original that pleasure I will not lessen. Rossmin river differs from the Blackwater in all the strength of contrast; the banks are high, the pools deep, the breadth narrow; and a wind very high, and blowing in a particular direction, is  $2 \ge 2$ 

required to act upon the river, in order to afford sport. At best a stranger will find it difficult to be angled. The flics are required to be a size larger than those of the Blackwater, although the Rossmin is a narrower, and apparently a very inferior river. It abounds in trout of the best description, rising to four, five, and even sever pounds weight, and there are in it pike of a formidable size. The greendrake, in the season, comes upon it in amazing number, and then the angler is sure to have great sport, and to take great trout. Trolling with the Loach, or, as popularly estived in Ireland, the Callagårian, and the Man-Aerper, very large and many pike are caught, and sometimes the Kerewage, or clock, is

ANGLING EXCURSIONS.





# A note on Roach



Roach were documented as being very well established and widespread across County Clare by William Belton in 1833, 56 years prior to the commonly believed introduction theory.





### William Bilton, The Angler in Country Clare, 1833: 1 of 2

### 154 BEAUTY OF GLENGARRIFFE.

of grandeur and loveliness with which these scenes abound; and then, while his soul was yet glowing with those characters of beauty, to attempt to transfer them to the written page, and impress upon another's mind a distinct conception of the picture which had so charmed his own. Would any thing but a vague though pleasing image of a magnificent association of rock, and wood, and vale, and mountain, be the result?

I should strenuously advise the tourist, who has leisure, to remain a few days at Glengarriffe, and make himself familiar with its romantic scenery, which, I am conscious, I viewed much too cursorily. In addition to the main features, to which I have alluded, he will find many charming details in the immediate environs, many most interesting excursions at greater or lesser distances, that will amply gratify his love of the picturesque; while, if he be an angler, he may enjoy some amusement in the Lakes of Mount Caha, on the one side, or of Inchigula,




William Bilton, The Angler in Country Clare, 1833: 2 of 2

### DELIGHTFUL SUNSET.

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on the other : the former of which are said to contain an abundance of brown trout, the latter some of the largest pike in Ireland.

I lingered long on the hill-side, by Captain White's Castle, to gaze upon the splendid panorama of sea and mountain which the sun, then fast sinking in unclouded radiance towards his ocean-bed, invested with additional charms; clothing the Bay's winding shores in a panoply of golden light, while he cast a deeper and a darker horror over the precipices and gorges of the mountains. I could not tear myself away from the scene, which changed momently under my gaze, and which each change seemed to render still lovelier. Gradually the rich hues of sunset melted into a chaster and more sober light, insensibly blending with the empyreal azure. The gigantic masses of the mountain ranges were projected across the clear heavens with taller height and more defined outline; until, at length, the young moon, with her choral train of attendant stars, modestly entered

# Appendix F

# Economic and Ecological Effects of Pike Management Operations Conducted by

# Inland Fisheries Ireland and Deficiencies in its Justification

(Note: Document Drafted by The Irish Pike Society & The Irish Federation of Pike Angling Clubs

# Appended Separately

Considered Highly Relevant to the Economic and Ecological Effects of the

'Long Term Management Plan for the Western Lakes' Proposed by Inland Fisheries Ireland)

# Economic and Ecological Effects of Pike Management Operations Conducted by Inland Fisheries Ireland and Deficiencies in its Justification

Document

P160301/030/001



### **1 REVISION HISTORY**

Revision History						
Revision	Author	Notes				
1.0		First Issue				

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were nominated jointly on behalf of the Irish Pike Society (IPS) and the Irish Federation of Pike Angling Clubs (IFPAC) to prepare this document for submission to Inland Fisheries Ireland. This document represents the views of IFPAC & IPS.

Signed:		
	(IFPAC)	



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## 2 INTRODUCTION

The purpose of this document is to provide an overview of pike management operations by Inland Fisheries Ireland (IFI). The justifications for these operations will be explored and both old and new science and research related to this subject will be compared.

Current Pike Management Policy will be assessed against the wider National Strategy for Angling Development (NSAD).

The economic effect of pike management operations and the resulting effect on national and rural economies will also be examined.

It would be a failing of this document not to state that there exists, considerable resentment of pike by some sections of the angling community in Ireland. It may be that this resentment is founded upon a poor understanding of the role of pike within a fisheries eco-system; a generational continuance of long-held biases against pike as a competitor to the angler for trout; or simply an individually-held hatred of pike. These are indisputable realities that exist in Ireland in 2018 and would appear to have existed since IFI was formed in 1951 as the Inland Fisheries Trust Incorporated (IFT).

IFT itself was formed "with the objective of developing brown trout Salmo trutta L angling in Irish waters" Fitzmaurice, P. (1983). Since 1951, pike culling has been a significant objective of IFI and its predecessors, through to the present day, where pike are still removed by IFI from approximately 20% by area, of our lake water bodies in Ireland. It is perhaps against this back drop that the relationship between IFI and pike should be considered.

### **3** INLAND FISHERIES IRELAND'S 'CORNERSTONES' FOR PIKE MANAGEMENT OPERATIONS

Inland Fisheries Ireland (IFI) (formerly Central Fisheries Board (CFB) and Inland Fisheries Trust (IFT)) has engaged in the practice of pike management operations since 1951. The methods of gill-netting and electrofishing are used as tools for pike management. The basis for these operations is to reduce predation by pike on trout, on what are termed "designated wild brown trout fisheries" such as Loughs Arrow, Corrib, Mask, Sheelin, Conn, Cullin and Carra.

There are two cornerstones of justification for pike management operations. The first of these stood until 2013 and was based on anecdotal evidence that pike were not native to Ireland. This was proven to be unfounded when research was undertaken by University College Dublin in collaboration with IFI as part of a PhD study. The following is an excerpt from the related press release by IFI, dated 15<sup>th</sup> October 2013.

"NEW STUDY REVEALS PIKE ARE NATIVE TO IRELAND"

"Inland Fisheries Ireland welcomes the publication of an important scientific paper relating to one of Ireland's key angling species – pike. The angling industry is estimated to be worth €750m annually to the Irish economy."

"Pike (*Esox lucius*) is a species that was thought to have been introduced by man in the last few hundred years. Results from this informative research have shown that the colonisation history is more complex, with an indication that they may have colonised naturally some thousands of years ago."

The new findings were further welcomed by Minister Fergus O'Dowd at the Department of the Environment who stated: "I welcome the findings from this important investigation and commend the excellent collaboration between UCD and Inland Fisheries Ireland, who have recently signed a MOU to support this type of ground-breaking research".

for IFI, stated that "These important results will influence IFI's ongoing management strategy for this species. Stated that "Further investigations, using new and developing genomic techniques, will be used to endorse these findings".

Sections 4 and 5 of this document take a closer look at the cornerstone of pike management operations as it relates to the native status of Irish pike.

The second justification was that pike fed preferentially on salmonids and so were a threat on fisheries with large stocks of salmonids such as "designated wild brown trout fisheries". In 2014 this perspective was shown to be unfounded when again new 'ground-breaking' information came to light as part of the previously mentioned PhD study.

Sections 6, 7 and 8 of this document take a closer look at the cornerstone of pike management operations as it relates to the diet of Irish pike.

### 4 PAST RESEARCH RELATING TO THE ORIGINS OF IRISH PIKE

Prior to 2013, no genetic or scientific research was undertaken by IFT, CFB or IFI in order to establish if pike were a native species to Ireland. The origins of pike were in fact poorly understood, and very possibly, poorly examined.

# 4.1.1 THE BASIS FOR DESIGNATION OF PIKE AS AN INVASIVE SPECIES PRIOR TO 2013 RESEARCH

The designation of Irish pike as non-native by IFI and its predecessors prior to the 2013 research was based largely on anecdotal evidence. In the abstract below, which was released as part of the 2013 research, it is clear that there existed a lack of evidence to support the 'assumption' that pike were not native to Ireland.

Population Genetics & Management of Pike (Exox lucius L.) in Ireland

Debla Pedewchi<sup>17</sup> Mary Kelly Quan<sup>1</sup> Joe Cuffiey<sup>2</sup> Marin O'Grady<sup>1</sup> & Stefano Marano<sup>100</sup>

- School of Builegy & Environmental Science, University College Diblan
- "school of Europeanent & Life Sciences, Conversity of Salford

<sup>1</sup>Island Fisheries Ireland, Swords Business Campus, Co Doblin, Ireland,

\*debbs perheschs Standconnect in

### Abstract

Throughout the northern hemisphere, northern pake (Envr locust E.) is of paracillar sociarecontense value for recreational and tomanerical fishing. Within Ireland, pake we considered nen-native, although a lack of direct evidence leads this to be a contention roter among trakeholder groups. Historical management of the species law here based upon this isomorphics, leading to controversial poinces such as merinive sensorial of pike during position pointed operations, anned at protecting rative boson tions (Jains) were L.)

In Inclusion piles occurs in most therdewater systems, but wind provide or attempt has been made to investigate relatedness and connectivity among populations. Here I present the first farbaid-wide population genetic investigation, using uncrossibilite markets, to illustrate the minne of population connectivity in Inda freshwatery systems. This study provides evaluate of strong substructure, which by the foundation for a reapproximal of convert approaches to the management of this species as herband.

Keywords: Population genetics, management, pike, Ever lociur, microsotellites,

Excerpt from "Genetic Structure of Pike and their History in Ireland" (IFI/2013/1-4148) Pedreschi et al. (2014)

The 'assumption' that pike were not native to Ireland has been as mentioned earlier, a cornerstone for over 60 years of pike culling and removal. Section 4 will hopefully give the reader a greater understanding of the basis for this 'assumption' and some of the pitfalls of accepting this assumption without question.

This assumption was extensively researched by **construction of the second secon** 

### 4.1.1.1 THE USE OF LANGUAGE AS A BASIS FOR THE CLASSIFICATION OF IRISH PIKE ORIGINS

One of the primary arguments used by IFI and its predecessors to designate pike as non-native were references derived from the Irish language. The term "gaill iasc" and "liús" have been used in reference to pike with "liús" being "*much older*" according to research carried out by **contract on the second second** (2000).

S. (2000) found dictionary references to "gaill iasc" and "liús" but concluded that "gaill iasc" is likely a literary coinage, a creation from the 17th or 18th century. They found it impossible to pinpoint exactly when "liús" was first used although they concluded that it appeared that "liús" dates from somewhere between the 13th and the 15th century, indicating that pike were long established in Ireland prior to this period. Furthermore, they found that the word "gaill" has multiple meanings ("foreigners-" or "Gaul" or "Norseman") whereas "liús" they concluded is much more definitive.

(2000) discussed a secondary argument relating to language and questioned why there appears to be no old Irish name for pike. However, they commented that this cannot be fully proven, as it is possible that it did exist prior to the 13<sup>th</sup> century but no reference or record has been found. They concluded by stating that there are many native Irish species that do not have old Irish names or for which old Irish names have not yet been discovered. Some examples suggested were "mackerel", "cod" and the "common partridge".

## 4.1.1.2 THE USE OF ANECDOTAL HISTORICAL EVIDENCE AS A BASIS FOR THE CLASSIFICATION OF IRISH PIKE ORIGINS

Another primary argument used by IFI and its predecessors to designate pike as non-native were references derived from the work of **Mathematical States** who wrote "The Pike in Ireland" in 1957 and which was published in The Irish Naturalists Journal. Went was a noted historian who wrote several articles about Irish fish. In his publication he came to the conclusion that "...*it would certainly appear that it (the pike that is) is not a native fish.*" To come to this conclusion Went sums up a number of references which are now discussed.

initially references the language reference to pike of "gaill iasc". Section 4.1.1.1 details the potential flaw behind this reference and the likely erroneous nature of using language as a basis for the pike's native/ non-native status. (2000) commented that **"It is of extreme importance to note that international did not investigate the Irish word Liús"**. They further commented that "the word Liús appeared several times in articles published in The Irish Naturalists' Journal written by other contributors" and posed the question of why the word "liús" was not investigated when **Securit** "had articles himself in some of these Journals" and as such would have been expected to have been aware of the "liús" reference. This question remains unanswered. (2000) commented that one of **Second** primary references was the work of Giraldus Cambrensis, "a Welsh archdeacon who visited Ireland on two occasions at the end of the twelfth century". Cambrensis wrote the "Topography of Ireland". **Second Second**. (2000) comment that **Second** (1957) quotes Cambrensis in his article as follows:

..."The rivers and the lakes are rich in fish peculiar to themselves, and especially in fish of three kinds, namely, salmon, trout and mud-eels. ... But some fine fish are wanting. I mean pike, perch, roach, gardon and gudgeon. Minnow, loach, bullheads, verones, and nearly all that do not have their seminal origin in tidal rivers are absent also."

(2000) comment that there is an original translation of Cambrensis' writing and that the correct translation is as follows, indicating that some references are omitted from Went's translation:

"The rivers and the lakes are rich in fish peculiar to themselves, and especially in fish of three kinds, namely, salmon, trout, and mud-eels. But some fine fish, found in other regions, and some magnificent fresh-water fish are wanting. I mean pike, perch, roach, gardon and gudgeon. Minnow, loach, bullheads, verones, and nearly all that do not have their seminal origin in tidal rivers are absent also."

The above translation would appear to illustrate that pike and other species were present in the regions visited by Cambrensis in the 12<sup>th</sup> century, but the facts are unclear.

(2000) further suggest that some academics have their doubts about the value of Cambrensis' work and they therefore appear to be "wary of giving it more credit than it deserves" and cite a number of examples for this opinion in their research work.

Further references in **Example** article mention a thriving and established trade in exported pike from Ireland. However (2000) again find the reference to be incomplete.

"...we find in **Example 1998** 'Anglo-Irish trade' in the 16th century that pike were exported in the early part of that century to some of the smaller towns in the south of England. We do not know, of course, the origin of these fish."

They submit a direct quote from **Constant and S**'Anglo-Irish trade, as follows: "At the end of the fifteenth century and beginning of the sixteenth, however, they (this is the pike) appear as coming regularly from Youghal, Dungarvan, Cork and Kinsale to the Cornish ports..."

(2000) make three important observations here. Firstly, why did Went question the origin of Irish pike that were exported to England when it is clearly stated in the book referenced that they came from several named Irish towns?

Secondly, they comment that Longfield mentions the export of pike to England from Ireland at the end of the fifteenth century. Further in the same book there is a detailed reference of export of pike from Ireland to England in 1492, so they ask why Went ignores these pre-sixteenth century references to pike.

Thirdly, they conclude that if there was a thriving trade of pike in Ireland at the end of the fifteenth century then they were widespread by this time and could not have been a recent introduction as intimated by Went and others since.

In respect of Wents own background, they state that **Exercise Wents** worked for the Fisheries Branch of the Department of Agriculture and was a founding trustee of the Salmon Research Trust. They comment that Went was regarded as a very dedicated game angler who had no great regard for the fish species called pike.

In consideration of the above, one must ask if potentially, a serious conflict of interest existed.

### 4.1.1.3 FULL TEXT OF BARBE, F & GARRETT, S (2000) RESEARCH

#### THE PIKE IN IRELAND : A (NECESSARY) REVIEW

### Part In Line

The Datth Augling perturbs day Schreiner is which reported as out of the local advantial entires of the 20<sup>40</sup> convert file mass over 10 hades doner 10 Links of angling will contributed to everal singling respective. 2010 World War II by partial writing, alsort its personal pleasant of fifting, a periods on its float only harver, but fixed supply reasons. Most importantly, his writings by the foundations for a general belief and acceptance that catch-and-release fielding is a very important superi, accounty to protect our quart, given the increased pressure of pollution, over fiching

him fullyriany was a invasiont vision in the inlead of instant. He inself the country and sparst more: works deleting for automa, music plic, parth, back, brann als: Us was, and still by, well known, in the Familied area in particular for (47) to even "Sport Instead in Indust", another great receipts of the following and highly particle strategietys. Yes other 3 years in the summarized of their entropy, to could be over commit in the local Weine is a summary of the summary of the standard standard in the standard in the standard and pose Fisheries that pike is not a native species and has to be called on trout waters.

During the gillieriting compaign corried out by the Wortern Regional Fieleries Board on Langle Mask, Corrib and Carra in winter 90 and spring 90 a pandonate dehate took phore in the local and national press. Our contributor worker the following in our of his letters 1<sup>-1</sup>...pike, a phoreware whose label...<sup>6</sup> A short while later or foreign fish... should therefore he removed from these label...<sup>6</sup> A short while later 1 was told by an Irish speaking person Roing in the Gealtacht that this was incorrect since the Irish for other one difference for the state of pille was 'Bas'

Sizes then, my good friend Shane Gartott and I, together with the help of memorous very kind and helpful people, have gane through pilos of information and documents, in order to particle together the biology of brick pilos. We have also forward on arguments brought forward by Drick Fuberies Scientistics claiming the pilos are of recent introduction. More than one year later and although our work is far from Ensished, we would like to chare our flads, to date, with the interested reader. Indeed, no came across a number of very interesting referen

Let's first of all solve the "gall inte - bis" problem. Open any Irish dictionary and you'll use pile being translated as bis. Some dictionaries however mention gall inte as well. It appears that gall ince is a literary enimage, a creation from the  $1^{100}$  or 10th century. The original word for pike, like, is such older. Although it is impossible to pispoint exactly when it was first used it appears that his dates from nonewhere between the 17<sup>th</sup> and the 13<sup>th</sup> century, indicating that plke could very well have been on this island much imper than we were always led to believe...

THE PIKE IN HILLAND : A (NECESSARY) REVIEW

#### Fact 1 Street

In 1957 Arthur E.J. West wrote "The Pike in Industr". It was published in The Irich Naturediels' Journal. I can recommend the reading of these journals to anyone with an interver in the history of Irish nature and wildlife. A winter's evening by the open flex, fielded with a glass of your favorite drink becomes a real treat when reading through these Journah.

Wost was a noted historian who woste several articles about brisk fiels. In the ab mentioned publication Word came to the combusion that ".....R would cortainly appear that it (the piler that is) is not a native this." To come to this helfor Word sums up a nanalor of references and it has been extremely intercoining to look inter these in detail. It is important to point out that Wyret's work is will the main foundation of the piler's introduction theremy hold on to by the Irish Fisheries.

Part of his introduction theory relies on the absence of an old Irish name for pilar. Nout also writes that " the more modern name for pilar is gallines, which Derally means strange or iterign lish," In the first article we have shown that hash combining art

It is of extreme importance to note that Went did not investigate the Irick word Lin-(meaning plice and personality dating from somewhere between the  $10^{10}$  and  $15^{10}$ renture). The word Line approach several times in articles published in The Irish Nameshed: Anoreal writewe by other contributives it around highly enabled; that these date not rend these, as he had articles kinead! In some of these Journals, Did Went ignore "Line"? How, who?

We come to the heart of Went's introduction theory when he beings up his key witness Gradies Candersoni, Gradon Cambonnis was a Welsh neckdrawan who visited beland as two securious at the and of the intellife centery. He wrote the "Topography of Ireland", Ward gatter Candersonis in the article as follows:

... The revers and the lakes are eich in flob possilier to themselves, and especially in flob of three birds, namely, admost, itsue and mad-orly.... But some flow flob are someting. I mean plot, prech, revel, pardon and gadyon. Minnes, lowel, hullbaseb, versues, and nearly all that do not have their sensinal origin in tidal titers are aburst also."

New left's have a look at the original translation of Cambronnis' writing. I quote from the tantes per

"The rivers and the falses are rish in fish peculiar to themselves, and especially in fish of three darks namely, subson, must and mad-each. But some five fish, faund in other segima, and some mouthleast fishering working. It was working I wave pilo, perch, rouch, profess and pagevon, Minnew, back, buildwade, versues, and nearly all that do not have their seminal to see the second in in tidof elvers are aburnt also."

The underlined part of the latter quotation was emitted by Weat in his article, I have to stress on the extreme importance of this "ministate" in Went's work. We know that Candorsonis was in parts of the Southeast of the country and he might have travelled inland. When Candorsonis wrote "...found in other region...", doi he mean there was placete, in other parts of the country? Why slid Went sout this itst parage? The krish Fisheries have always seen the gaill inse theory as a solid have to prove their introduction theory. They have scaled down this theory in the heliof that gold ians in the Irisk word for pilor used in some parts of Word Nays. Successed agoin, Fm advaid, In The Irish matterialist someral, volume B, 1952-48, an article "Local memory of Irish Fishest" by G.P. Furran is published which membran Like for Mays. Not a mention of gull inve. Together with this organizat it is often said that plke cannot be native because there are laken where plke are absent. It appears to me that it is very difficult to defend this argument. There are numerous lakes where an troat or salassa can be found but do we see them therefore as introduced?

Besides, to us that pall lasc means foreign fish is in itself all too simplicite and incomplete. While lasc means undersburdly fish, pall can mean foreign but can also mean "foreigners." or "Gaul" or "Norseman". The word gaill lasc therefore does not prove at all that pike is an introduced lish species

at of the introduction theory is that there is no old brick name for plie. Unlike for species like solmon and front which both have old frish names. Sounds odid at first sight but down't make sense officer I'm afraid. Let's give our cally friend the markerel a thought. Or the cod maybe, I think everyons will agree that there are notice species to the lebbl coasts, Tet, they have no old lebb names' One could also look at our feathered friends and notice that a bled like the portridge bias no old lebb name, yet is mative in this country. In other words, the fact that pile has an old livids name does not prove anything. Sarely not that it is introduced.

Our "fluit" of the word Link has proven very important since. The word karps coming back in different publications and references and it will prove to be very significant indeed as these series of the highly interesting journeys along the history of Irish pike

So far for the introduction, In the next article we bring Dr. Went upon stage, and then it gets really interesting!

Text : Frank Barbi and Shane Garrett

This patient misquestation by Worst is the point of discussion here. However, Cambrensie's work should not be given inner oredit thin it deserves. Indeed, some academics here their doubts shout the value of Cambrensis' work. One of the reasons being the way in which he described iroland :

"On the whole the land is low-lying on all sides and along the coast; but towards the contro it rises up very high to many hills and even high mountains.

In conclude that he dail not not preved parts of the result? I Continuous stand gover account of "a field with linear gold backs" and "a value that was half not or." Lay to order Carping Continuous or will reported as a reliable strange by the break forderers.

Reading on in West's article we come across the following passage :

exported in the early part of that century to some of the on England. We do not know, of course, the origin of these fish."

Let's quote from A.K. Longfield's 'Auglo-Irish trads'direct new :

At the end of the fifteenth contacy and beginning of the stateenth, however, they (this is the pile) appear as coming segularly from Youghal, Dangarsan, Cort and Ebsale to the Cornish perc...\*

Three important observations can be made here. Firstly, why did Word question the origin of these Irish pike, exported to England? Whereas it ways clearly, in the book where he refors to, that they came from several named Irish towns

Secondly, LongReld montions the expert of piles to England from brokend at the end of the filtereth century. Further in the same book we oven find a detailed reference of export of pike from feeland to England in 1492. Why does Went ignore these pre-elektowic century es is pike?

Thirdly, if there was a therining trade of pike in lookand at the and of the followards they must have been proty widespread by then and could hardly have been into recently. (If introduced at all?)

Weat's article "The Pike in Ireland" contains more exferences to support his introduction theory, Some of them relate to personal artes of individuals which therefore cannot be leoked into. Others still most verification. Yet, it is clear that his work contains artison

And there is something else. Which is, again, of major importance, Arthur F.J. Would And there is something else. Which is, again, of major importance, Arthur F.J. Weid method for the Federice Branch of the Department of Agriculture and was a founding trustee of the Salason Research Trust, People who have him textify that he was a very district assum analytic this had on synch regression for the first quarks with a finite had the minist atomicant is a very extremented representer of the feelings meteorism. This find the much atomicant is a very extremented representer of the feelings meteorism. While the texture will the much demonstrat is a very extrementer representer of the feelings meteorism. This point mis is a excision smaller of emount. While their texturesings in subsh hear could beel will come their starting of the belok play by the day main foundations of day baths Federics' paties because their starting of the belok play by the day main isometisment of day baths. towards pile?

Considering the evidence of shortcomings in his work and the obvious conflict of interests should we regard Dr. Went as a reliable source?

In the next article we will been some more bricks in the "introduction-wall" the Irish Folsevies have built ever the last costury as we will make the single most impo-revolution in our series on the history of plus os far ...

Text : Frank Barbi and Shane Corrett

### 4.1.1.3 FULL TEXT OF BARBE, F & GARRETT, S (2000) RESEARCH CONTD.

### THE PIKE IN IRELAND : A (NECESSARY) REVIEW

### Part 3 : Of Pile and Ports

Before getting to the heart of our third article on the history of pike in Ireland we used to therify an often held minandrevianding. There is no concrete evidence to suggest that pike are an introduced species in Ireland. The introduction theory is based on references that have been regarded over the last contany by the trick Fisheries on conclusive. This is only a theory. In our first two articles we have shown that some of these references are incomplete, incorrect or even misleading. Others we regard as naive and surely not conclusive. Some first even the total triander on the regard as naive and surely not conclusive rough to dravity pike as introduced. One examples.

Around 1988 a commercial fisherman on Lough Commentations a fish which he cannot recognize, Subsequently it is identified as a pile. This incident is one of the reasons why the current Research Department of the Central Federice regard pile as introduced. When resulting the "Douostely Book of Massmooth Fishe" by Fred Boller, me ensure server several specimen pile caught on Lough Commentation back as far as 1870. (One such specimen is currently on display in the Natural History Messam in Dublin,) in other words, at a time when sure commercial fisherman caught the fish he could not identify, other people were claiming 40 and 50-pounders from the same take! Clearly, pile mout have been around for quiet a while if the lake was able to produce such meanter fish. The fish determination shifts from our friend seem to be in line with the science the Fisheries are serving as.

Let's conclude with a noteworthy passage from the same book :

Longh Const, where hig piles and hig ironst owne attracted a certain type of fisherman (the hig-fish mass) from all over Europe, now content to these who are constant to take a more certain hag of smaller fish (trend). This change is due principally to the systematic destruction of pile." The book was written in 1979.

Let's more on and look into another reference on which the introduction theory is based. We quote from a letter we received from Mc. P. Fitzmanries, Director of Hawarch of the Control Fitzmetrics: "A review of bidentical brids annuls carried unit in the 1980's found on reference to pike in any documentation prior to the 15<sup>th</sup> Contury."

We pressure Mr. Fitzmanetee refers to the article "The Pike in Ireland" written by Arthur E.J. Went in 1957. We dealt with Went and the contexts of his work in our second article. However, spart from proving that Went's work was incomplete and parts of it incorrect, we also discovered a few more interesting facts that prove Mc. Fitzmanetics's quote highly dealstful.

"Regimen na Shinte" is a medical teet from e. 1429 which contains references to pike. It is an Irich translation of a Latia medical tract which originated in Italy. Intervening to note is

that the person who translated the text (in the early 15<sup>th</sup> century) used the leish word like for pike, rather than merely transliterating the Latin Jackso. It appears that the leish translatur was already familiar with the leish word for pike. Since the original Latin text of this work was written in Baly, the references to pike are not directly relevant to the presence or absence of the fish in Ireland. However, the fact that the Irish translator knew of an Irish word for pike seems proof to an that the fish species occurred in Ireland early 14<sup>th</sup> Conterv. For the sceptical ones among as we will back up this theory and take it one step further.

The Irish Grammetical Tracts are a collection of rules of grammar and diction which avointed student poets in fearming their craft. We will quote one such short poem which was written or 1400 :

"do spoilt gialla pig dos philo

de Minig Silo na Simma nam."

It was Chinese to as as well so we get the experts to translate it for an. The translation sounds as follows :

"The young man split a branch of the fir-tree,

he entired up the pike of the Shannon."

This passes beings on the conflormation that there was indeed pike in bedand, more precisely in the Shannon, ex 1400 and that no one found this remarkable. That no one found this remarkable leads as to conclude that they were there for quiet a while. It is itempting to draw further conclusions considering the loandreds of kilometers the Shannon every and the numerous big and small lakes it connects.

The importance of the two above mentioned references taken into account we can rest ansared that the chain that there was no (reference to) pike in Federal before the 19<sup>th</sup> Century is outlated and incorrect. After all, the review the current Research Department of the felds Federates have themselves on dates from the middle of the 20<sup>th</sup> Century...

In our final article we come to the conclusion of our series on the history of pike in Iridand. We will approach the pike's history from a few other angles, and bring up a few sources which consider the pike as being native to the Irisk country...

Text : Frank Barbi and Shane Garrett

### 4.1.1.3 FULL TEXT OF BARBE, F & GARRETT, S (2000) RESEARCH CONTD.

### THE PIKE IN IRELAND : A NECESSARY REVIEW

### Part 4 : The Exes-Files Conclusion

With this article, we exame in the conclusion of our series on the history of pike in Ireland. We chould add however that we are currently preparing a special appendix to our story, in which we will focus no councrustion. As our research into this intriguing subject has become an ongoing process, updates can be expected. Before we start drawing conclusion should be significance of the contexts of our weiches, we will first of all look at the pike's history in Ireland from a few ether angles.

### Native or and?

Although it seems almost sure that pike have spread in certain parts of the island later than in others, anabody has ever periodide concrete evidence of its introduction. Indeed, issue sources claim pike as being antive. In 1990 Baltert Linyd Praeger wrote "The Nateral Bhatery of Dreland", is which he chaodles the pike as an helds native fish species. One handered years before that, William Thomson notes pike as being mative. Andh Marc Doushandl from County Month wrote a tract on natural history in the same period. File is the first fish he mentions as being mative. He docurden it as "riters, bright and testy". We know from our last article that pike are power to be in Irrhand are ably years before that. However, it is still two jointeroing to see that the pike was no catchibdeed part of the pikester found to C. Newli to the ourly 19<sup>th</sup> century and was not referred to an being introduced but classified native.

#### Other species in other countries.

In our concervity we have not limited corrective to behand alone. We have looked around Europe and come serves several interesting "incidents" which give hope of surrouting the pilkr's history hore. Our first steps in Spain and we must two old Friends, Arthur Went and Gredden Cambrenis. The latter was referred to in a publication of The Field Networkshild "Journal verifies by Arthur Went in 1940, Went relies on Cambrenski" hanceledge but as we already know, both are not "the perfect example of a reliable witness": Went quotes Cambrenski, who chinned that "no part of Spain problem pile". A step painting of a pille in Northern Route drawn in the Yoson Ages prove that they were not introduced and that once agels Cambrenski and Went had it wrong.

Next we go to Holland where in the  $20^{10}$  Contery a discussion took plane whether the ratifield was an indigenous species that should be protected or whether it was introduced in the late modical period by masks. It was only in 1979 that field remains from a member of probinstric methoments were identified. It appeared that eatild were present in The Netherlands some 400 years BC. The poor mask who alongity webbled his way with balen backet to the Datch waterside was insurent...

Chair to home we arrive in England where the touch has been regarded as an introduced species. Truch is a warm water dub which rould not have serviced the lerage, altegohly. Recent excernations in Setfleds carried out by the Time Team found nat only pike her also truck remains. They were some 400,000 years old. Teach may now he ergarded as antire over there.

Our trip around Europe brings us home again and even here we can serve you a prefect example of how theories are only theories. The endd is often classified as an introduced lish species to frisk waters for reasons similar to the English teach. Until endel remains pupped up in escarations curried out in Poethruddan Carce in Co. Antein, This find dates from the first kull of the 20<sup>th</sup> Century and puts the presence of ruld in feeland back in the lenn Age.

We thought it was important to quote these different examples. If only in wars the readers not to pass out if homerever pills remains of a exaple of thousand years old are hourd in lockand. Stranger things have happened...

### Some conclusion

Several conclusions can be drawn taking into account the pike's turbulent recent history in leviand. The first one should be that there is much more work to be done and many more references to be looked into. Nonzerous people is fiberaries and universities have told us that there is much more interesting information "suft there",

Archaeologists have bardly legues looking into the penalste presence of fish remains in recentration sites. Understandably, houses areliants and tidal settlements have always carried the prime interest. Having solid that it is very resonanging to see that Aidan O'sufficus who brack the archaeological Discovery Programme takes a grant interest in Lake Settlement. Hopefully they'll think of an when they find a low fish boson?

Derived from this flort conclusion we must been as the frish Fisherics and the work they have carried out as far in this control. During this arties at the biology of plac in technol and its alleged interductions we have proven shortly an summersus excessions that there is something wrong with the introduction theory. It is not ease at all that plac are introduced and numerous references as which they have built this theory are doubtful, manuplete and even wrong.

This bands to our makin conclusion. In one prace's research we have found more about the pike's history than the Irish Fisheries did in half a century. While we are sarely very deficient in what was are doing, we are not mismion and he not have for example regular access to National Libraries and Meseume. Everything had to happen in our space time and living in two different countries sarely disk' maker it maker for an The Piberies have their sens turan of scientists, even their wes Research Department. If they disk' meseage in find in 50 years what we found in our year them there is assure that assume and keep their policies on the interactive form there is assure that assume and keep to half any their policies on the interactive form there is assured by anyone and keep to half any their policies on the interactive fields's interactive their sense they their policies on the interactive fields in the dyname error told asymmets and keep to half any field policy is black buying to find whething. The cases against the pike visual to a support on the prevention field in the dyname error indexed for the truth and the few people who did always isoleid huging to find where instead the sole approximation policy is blackers in the interactive fields in the dyname error isolation for a difficul review an the pike's history and the creation of all discriminatory measures against pike notificat review is examplet. We cannot where even actions, This cannot be tolarated any lenger, More than this an efficied imprive just the isolated the angling in the bish Fasheries is acceled. We have that an efficied imprive their pointage in the angling radius in the lower theoret that the Angling trends fidder own actions. This cannot be tolarated any lenger, More than this an efficied imprive just their and the angling in the bish Fasheries is assued. We have that an efficied imprive is on the agends in the North, however, having trends. We have that a efficied imprive is on the agends in the North, however that the Angling treland ful

#### Request

Before rounding off we would like to ask anyone who thinks he or she might have interesting information or stories to add to our research to come forward and help on with our quest. Any bit of information, however small it is, is welcome to help complete the puzzle. We can be constanted via emild at <u>limit infinite.</u>

#### Acknowledgement

Summing up a list of all the people who helped us in compiling these articles would force us to write another article? This would lead us too far to everyone who knows he ar she contributed is kindly thanked. We wish however to coalse two exceptions. First of all we would like to thank the Editor of Angling beckned Frank Quigley who give us space to show our fluctings. Anyone reading this should realize how lucky levitand is, in faving a fishing magnetize that is not howing to influential groups like advertiors, rishs or organization regarding the contrasts of its articles.

Secondly we would like to meeting and thank Nicholas Williams, Head Lectures of The Irish Department, University College Dublis. He sever tired of our requests for information, exploration and translation. He led us to unmerves references and other people and without him this story would more than likely never kave been written. We would like to fishels by queting Me, Williams directly 1 "More research would, I am meet, yield more evidence that the pile is indigenous."...

Written by Frank Barbi and Shane Garrett

# 4.1.2 SECTION SUMMARY CONCLUSION: PAST RESEARCH RELATING TO THE ORIGINS OF IRISH PIKE

The analysis of the information presented in Section 4.1.1 and its subsections show that prior to 2013 the basis for the designation of Irish Pike as non-native was anecdotal, inaccurate and unscientific. The erroneous classification of Irish pike as non-native lasted for over six decades.

Of particular concern is that the leading fisheries scientists of IFI and its predecessors have apparently accepted this erroneous classification without question. Indeed, the extensive research carried out by Barbe and Garret in 2000 has to our knowledge, never been disputed by IFI or its predecessors, over the past 16 years, yet the pike remains officially 'non-native' to Ireland.

The closing statement of the **Second Second** (2000) research is of particular relevance and reinforces the depth of their research and the external support they received from independent experts within the field of Irish culture and history. **"Secondly, we would like to mention and thank Nicholas Williams, Head Lecturer of the Irish Department, University College Dublin. He never tired of our requests for information, explanation and translation. He led us to numerous references and other peoperation and without him this story would more than likely never have been written. We would like to finish by quoting directly: "More research would, I am sure, yield more evidence that the pike is indigenous."**.

It is the conclusion of this section that the 'non-native' status of Irish pike based upon past unscientific research is erroneous but also potentially disingenuous.

### 5.1.1 THE ORIGINS OF IRISH PIKE

In 2012, Debbi Pedreschi of University College Dublin (UCD) supported by Professor Stefano Mariani (UCD), undertook a PhD on the population ecology, dietary and trophic status and morphometrics of the freshwater fish pike (Esox Lucius) in Ireland. This ground-breaking research was undertaken by UCD in collaboration with IFI and was supported by the Irish Federation of Pike Angling Clubs. As stated earlier, it was the common belief that pike were introduced to Ireland approximately 400 years ago from England, so the importance of an actual scientific study to examine these beliefs was long overdue. The report on the origins of pike aspect of this study was released in 2013 and was called the **"Genetic Structure of Pike and their History in Ireland"**. This aspect of the study indicated that pike colonised Ireland naturally about 8000 years ago in a similar way to other native species such as trout. The study also paid particular caution to current pike management operations and strategies as a strain of the species was discovered through DNA analysis and found to be unique to Ireland. The study commented that aspects of the management of pike in Ireland were "potentially compromising the integrity of genetic stocks".

The 2013 study was the first of its kind undertaken by IFT, CFB or IFI into the pike species, and used microsatellite DNA studies of pike from Ireland, Great Britain and the European continent to establish the lineage of Irish pike. The results were ground-breaking but of little surprise to the pike-angling public, who had for many years questioned the validity of the previous research discussed in Section 4. The press release issued by IFI on 15<sup>th</sup> October 2013 stating that "New Study Reveals that Pike are Native to Ireland" signalled that Irish pike may finally enjoy the recognition that the species was denied for many decades.

### 5.1.2 RECENT CHALLENGES TO THE CLASSIFICATION OF IRISH PIKE AS A NATIVE SPECIES

The robustness and depth of research undertaken by Debbi Pedreschi and Prof. Stefano Mariani was illustrated in 2014 when the findings of their report "Genetic Structure of Pike and their History in Ireland" were challenged by Dennis Ensing in an article titled "Pike (*Esox lucius*) could have been an exclusive human introduction to Ireland after all: a comment on Pedreschi *et al.* (2014), Journal of Biogeography". Dennis Ensing works at the Agri-Food and Biosciences Institute (AFBI) in Belfast, Northern Ireland, which advises DCAL on freshwater fish management policies.

Ensing argued that there was a possible human introduction much earlier than previously hypothesised by Pedreschi *et al.* (2014) Ensing argued that a human introduction occurred as far back as 4000 years ago by Neolithic or Bronze Age humans and that this was a basis for questioning any designation of Irish Pike as native.

In 2015 Pedreschi and Mariani responded in an article titled **"Towards a balanced view of pike in Ireland: a reply to Ensing, Journal of Biogeography"** and effectively removed any doubt in relation to the validity of the study first released in 2014.

Furthermore, the opinions expressed by Ensing in his paper were considered by Pedreschi and Mariani (2015) to be *"too speculative and unsupported by data"*.

Ensing (2015), in his response to the aforementioned paper, argues against these conclusions, suggesting that Neolithic or Bronze Age humans may have introduced pike into Ireland c. 4000 years ago. Here, we outline our contention that this does not fit with the available scientific and historical evidence. We argue that the presentation of opinion in the comment by Envirol. (2015) is too speculative and unsupported by data, and represents a hypothesis that will abways remain difficult to test.

Excerpt from "Towards a balanced view of pike in Ireland: a reply to Ensing, Journal of Biogeography" Pedreschi (2015) The response of Pedreschi and Mariani (2015) to Ensing also highlighted how Ensing's article focused on pike as the sole threat to wild brown trout stocks and how Ensing failed to mention the many threats to wild brown trout stocks, tending rather to focus on pike.

Of particular interest is that the response of Pedreschi and Mariani (2015) to Ensing raised the issue of Irish freshwater fauna studies being somewhat neglected and how long-held assumptions can hinder the way for fresh knowledge.

> In framing the issues relating to pike management. Ensing (2015) fails to mention the many other threats to brown must (Salmo trutta) populations, such as the unbalance caused by introduced and invasave species (e.g. roach, Rutilus rutilus; Stokes et al., 2004; King et al., 2011; Lagarosiphon major; King et al., 2011), habitat destruction (e.g. large-scale arterial drainage in Ireland; Inland Fisheries Trust, 1952-1980; Massa-Gallucci et al., 2010; King et al., 2011), eutrophication (McGarright, 2005); sea litte (Stakes 19 nL, 2004) King et al., 2011) etc., and instead focuses only on pike. While we acknowledge that pike can indeed have an impact on trout numbers (O'Grady & Delanty, 2008), they decline.

Historically, the freshwater fauna of Ireland his been somewhat neglected by those conducting genetic investigations and phylogeographical analyses, with long-held assumptions hindering the way for fresh knowledge. Recent mudies Woscia et al., 2013; Pedreschi et al., 2014) are lifting the sell and beginning to reveal a more comples phylogeographical history than previously envisioned. These recent developments have stimulated renewed interest and discussion in the field and encouraged the development of new studies and hypotheses. Many ubiquitous freshwater species in Ireland remain to be investigated Iguidgeon, Gabior gobio: stonelouch, Barbaare by no means the sole reason for their tula barbatula; minnow, Phoxinus phoxinus; perch, Perca fluviatilis).

Excerpt from "Towards a balanced view of pike in Ireland: a reply to Ensing, Journal of Biogeography" Pedreschi (2015)

It is worth noting that Pedreschi and Mariani (2015) acknowledged senior scientific staff of Inland Fisheries Ireland for their assistance in compiling the response to Ensing. Therefore, it could be presumed that Inland Fisheries Ireland would support the response of Pedreschi and Mariani to Ensing (2014).

# 5.1.3 CLASSIFICATION IMPLICATIONS WITH SPECIFIC REFERENCE TO THE EU WATER FRAMEWORK DIRECTIVE

Kelly et al. (2014) summarised that the Water Framework Directive (WFD) (2000/60/EC) came into force in 2000 and was subsequently transposed into Irish law in 2003 (S.I. No. 722 of 2003), with the principal aim of preserving those water bodies where the ecological status is currently 'High' or 'Good', and restoring those water bodies that are currently impaired, to achieve at least 'Good' ecological status in all water bodies by 2015 or by designated extended deadlines. Furthermore, it was stated that a key step in this process is that each Member State must assess the current ecological status of surface water bodies (rivers, lakes and transitional waters) by monitoring a range of physical, chemical and biological quality elements including phytoplankton, macrophytes, phytobenthos, benthic invertebrates and fish.

Inland Fisheries Ireland has been assigned the responsibility by the Environmental Protection Agency (EPA) of delivering the fish monitoring requirements of the WFD in Ireland. The Agri-Food and Biosciences Institute (AFBI) in Belfast has primarily represented Northern Ireland in this regard.

A key aspect of the fish monitoring requirement has been the joint development by IFI & AFBI of an ecological classification tool i.e. 'Fish in Lakes 2' (FIL2). Similar work was carried out for rivers. The 'Fish in Lakes' ecological classification tool was developed during the North-South Shared Aquatic Resource (NS Share) Project in 2008. (Kelly *et al*, 2012b) further developed the classification tool using "additional data to make it fully WFD compliant".

It is at this point that it must be made clear that the WFD 'Fish in Lakes' classification tool classifies all freshwater fish species according to their native status. The native status of pike is based upon the notes on pike contained in Went (1949) and takes account of Went (1950), both of which pre-date the scientific research undertaken by Pedreschi *et al.* (2014) using micro-satellite DNA.

It is interesting that Went (1950) states that the rudd (Scardinius erythrophthalmus) "*is a native species*", *yet* (Kelly *et al*, 2012b) have re-designated the rudd as "*non-native*". The inference here is that the application of Went (1950) as a basis for the establishment of the native status of Irish freshwater species would appear to be contradictory when considered in the context of the WFD, which favours instead only fish tolerant of marine conditions. Regarding pike in Ireland, Minchin (2007) in his compilation of alien and cryptogenic aquatic species in Ireland was unconvinced of the evidence suggesting pike to be alien and instead cited pike and indeed rudd as cryptogenic species.

Kelly et. al (2014), in their WFD Summary Report for 2013, commented on the research of Pedreschi *et al.* (2014) by stating that *"recent research suggests that pike may have colonised Irish waters naturally, without the intervention of man and therefore be mislabelled as a non-native species (Pedreschi <i>et al.*, 2013); however, further *evidence may be needed to verify this"*. It would be presumed that the *"further evidence"* that *"may"* be needed, would be sought, yet Kelly et al. (2015) in their WFD Summary Report for 2014 maintain the status of pike as non-native, having removed previous comments relating to Pedreschi *et al.* (2014). To our knowledge IFI have not sought *"further evidence"*, which would lead to concern that the WFD 'Fish in Lakes' classification tool will not be re-examined.

It is clear that to re-classify pike under the WFD as a 'native species', while supported scientifically through the research of Pedreschi *et al.* (2014), is not without complication for the 'Fish in Lakes' classification tool. It may be argued that at present, it necessitates a divergence between the Republic of Ireland and Northern Ireland via the respective representative bodies of IFI and the AFBI, to possibly accommodate two separate classification tools. This matter would be greatly simplified if the AFBI were to endorse the findings of Pedreschi *et al.* (2014). The response of Ensing (2014) to Pedreschi *et al.* (2014) would suggest that the AFBI may not be open to a re-classification of pike. In response to Ensing (2015), however, Pedreschi and Mariani (2015), see section 5.1.2, provided a balanced view of pike, that one would hope would alleviate any concerns that the AFBI might have. As such, there would appear to be no valid reason for IFI to discount the latest and only scientific research available for the re-classification of pike as a native species in the context of the WFD.

There exists a substantial body of evidence within the scientific community supporting the spread of freshwater fish and fauna by non anthropogenic means with particular reference to avian transfers.

There are many examples throughout such studies of freshwater bodies that have been formed naturally or created by man (ponds, reservoirs etc.) that are isolated and initially devoid of fish. In many cases, following colonization by water fowl, fish species begin to appear. It has been proven that fish ova from certain species can survive within the down of water fowl for considerable time and be transported over hundreds of kilometers in many cases. Additionally the survival of freshwater organisms, including fish ova, within the digestive systems of water fowl has been proven (van Leeuwen et. al. 2012).

Specifically in relation to pike and perch, studies by Fr. Scheimnz (1925), Kammerer (1907), A Thienmann (1950) and O Preusse (1925) have shown the transfer survivability of ova from these species with live fry successfully hatching from eggs found in duck faeces following transfer from one water body to another.

correct retermining published his , Verbrachingupgrodik/die der Skilbwasserfertweh Europac<sup>1</sup>. On page 176 his given a septer on , Transport of septeric antimich by backe<sup>1</sup>. I found an English translation of the Gamma text by Nock P.L. B.A. Translation No. 575. Find it attached. It is intervening, but notes interesting I find the paper he is color, Schlerer 1875. Fish segt resistance spaced on transport (in Communic). Triation shit is the labors, at least 100 Regists allow fee the married in 1970 A. Thiormanie published his "Ver Southering, has beinge former (1.1.p. \$55). It has been established Marings approjects that the appen of Props and title out also much in the sir in satisfies research for a to fair here been be togenetice and easily motion, while it is satisfy be been request insuring vertices former, set as the a). The other nt another paper is cited. Preside 0, 1925, How do fish disposes II, the Ge rapp in dock flass. A few dops later by of East basiss handed from these load dispersid virtually not considered but possibly very important. If steel H. (In Correspondence of a first the second and function of the andlines for spectra an becaute. (2018 100, p. 76). as at And when you will be selected through the state of a state of the specific state. and the second state and a second spectra and the second state of An exception of the world and appropriate function of a set and a set of the . - 1-p server the server of the later of the server second a set the addre if the Borts Second Industry and plantechie of the blind is installed one, at times further multi, spend by some tipts (the tailed of worth in the Middle Maine, Pool of the Alterbain Sta and a destroyed on the Unner Malard (LAUSSINGS 1915, p. 71).

# 5.1.5 SECTION SUMMARY CONCLUSION: CURRENT RESEARCH RELATING TO THE ORIGINS OF IRISH PIKE

The fact remains that the scientific research of Pedreschi *et al.* (2014) represents the single most important and only piece of scientific research produced on the native status of Ireland's pike since the formation of IFI as IFT in 1951. The depth, robustness and scientific validity of this research has been illustrated by facing and easily discounting challenges posed to it generated by peers and others.

In relation to the EU Water Framework Directive, it is feasible to contest that the failure of IFI to embrace the new scientific research of Pedreschi *et al.* (2014), with or without further corroborating scientific evidence, places at risk, Ireland's successful achievement of at least 'Good' ecological status for all fisheries in Ireland. Furthermore, it would appear to contradict the statement referred to earlier and issued on 15th October 2013 by Dr. Cathal Gallagher, Head of Research and Development for Inland Fisheries Ireland, that "further investigations, using new and developing genomic techniques will be used to <u>endorse</u> these findings". The use of the specific term "<u>endorse</u>" suggests support of the previous findings, not contention.

IFI have expended resources, at a cost to the Irish tax payer, in undertaking research into Irish pike origins through the period 2010 to 2013. The findings of the resulting report **"Genetic Structure of Pike and their History in Ireland"** Pedreschi *et al.* (2014) have yet to be considered in formulation of pike management policy and hence the resources used in this study have yet to deliver any meaningful return to the Irish tax payer.



### 6 PAST RESEARCH RELATED TO THE DIET OF IRISH PIKE

The release of the report **"The Diet of Pike in Irish Watercourses"** in 2014 by Debbi Pedreschi as part of a PhD, and Pedreschi *et al.* (2015) following peer review, is arguably the single most important and only scientifically-based study into the diet of pike in Irish waters. Subsequent to this study, the investigations into the diet of pike in Irish waters was conducted only by Inland Fisheries Ireland and its predecessors and relied upon snap shot stomach content analysis using a potentially flawed methodology i.e. gill-netting. This is not a term used lightly and will be discussed later in Section 6.

Pedreschi *et al.* (2014b) used a combination of Stable Isotope Analysis (SIA) and Stomach Content Analysis (SCA) to provide a more reliable projection of the diet of pike in Irish watercourses. Of particular interest was that Pedreschi et al. was very cognisant of how complicated the diet of pike in Irish waters can be.

Pedreschi *et al.* (2014b) stated that "sampling using a dedicated plan rather than opportunistic sampling would also facilitate a wider range of analyses and hypothesis testing, including, for example, comparisons between seasonal variations in diet". The significance of this particular comment is that to date, the data presented by Inland Fisheries Ireland gained over many decades does not reflect seasonal variation, and has allowed assumptions rather than scientific fact to drive management policy. Proof of the paucity of seasonal sampling has been acknowledged through freedom of information requests to IFI and therefore represents a considerable failing of past research into the diet of Irish pike.

It is important to note that past research continues to be used as the basis for and justification of pike management operations in Ireland by Inland Fisheries Ireland. Some of these apparent justifications will be further discussed in this section.

# 6.1 THE ECOLOGY, BIOLOGY AND MANAGEMENT OF PIKE IN IRISH WATERS WITH PARTICULAR REFERENCE TO WILD BROWN TROUT LAKE FISHERIES

The current position paper supporting pike management in Ireland is **"The Ecology, Biology and Management of Pike in Irish Waters with Particular Reference to Wild Brown Trout Lake Fisheries"** ref: O'Grady & Delanty (2008). The paper refers to several reports and scientific data to support a programme of continued pike removal from a number of significant fisheries in Ireland known to produce quality trout and pike angling. It is the content of O'Grady & Delanty (2008) that forms the basis for the pike diet examination undertaken in this document as it is felt that there are significant fundamental inaccuracies presented in O'Grady & Delanty (2008) with regard to the impact of pike on trout stocks.

The pie charts shown below in the excerpt from O'Grady & Delanty (2008) show a sample of food items found in pike stomachs in Lough Sheelin over a period of 29 years from 1978 to 2006. This information is the subject of further in depth examination in section 6.2.4 following a freedom of information request to Inland Fisheries Ireland, as this document contests that the information made available for this period exhibits worrying inaccuracies and anomalies that question the reliability of the information presented by IFI to support pike management.

A further excerpt from the presentation made to the Pike Policy Group in 2011 as part of the previous pike review is also included in this section. With regard to both of the excerpts in this section, it can be seen with specific reference to the dietary items in pike >60cm that wild trout constitute 16% of an adult pikes diet. However roach and roach fry have been separated, even though they are the same species. Perch have also been separated into fry and adult fish. It could be assumed that in order to maintain any sort of consistency then trout should also be separated by way of mature and immature fish to give the reader a more accurate picture of the dietary items found. As roach and perch are more numerous, e.g. see excerpt section 6.1 i.e. Table 1 of O'Grady & Delanty (2008) with regard to roach, it appears logical that pike will feed more readily on the more available species. For instance, the total consumption for roach and perch is 47%, nearly three times that of trout. This suggests that trout are not the main food source of pike in Lough Sheelin and while ratios may not reflect the apparent availability of each species to pike as a food source, O'Grady & Delanty (2008) do not explain this anomaly, but instead accept an apparently biased hypothesis that pike prefer trout as a food source. This document attempts to redress this imbalance in current thinking by offering unbiased alternative discussion based upon IFI's own information.







Excerpt - Figures 4a, 4b and 5a from "The Ecology, Biology and Management of Pike in Irish Waters with Particular Reference to Wild Brown Trout Lake Fisheries" O Grady & Delanty (2008)



A presentation to the Pike Policy Group, November 2011

# 6.1 THE ECOLOGY, BIOLOGY AND MANAGEMENT OF PIKE IN IRISH WATERS WITH PARTICULAR REFERENCE TO WILD BROWN TROUT LAKE FISHERIES CONTD.

Pike dietary studies undertaken prior to the Pedreschi *et al.* (2014b) pike diet research show that in many cases the conclusions of those previous studies are contrary to the data that is supposed to support them. In the table below i.e. excerpt Table 1 of O'Grady & Delanty (2008), it can be seen that as roach populations increased they featured up to seven times more than trout in the diets of the surveyed pike. This appears to contradict the concluding remarks that stated the continuation of predator control was imperative as an increase in pike numbers along with their apparent preference for trout would see trout stocks severely affected.

In contrast to the previous pike studies, the report entitled **"The Diet of Pike in Irish Watercourses"** Pedreschi *et al.* (2014) stated that the research data had shown "*the marked opportunistic nature of individuals that appear to be utilising resources in proportion to their availability in the surrounding environment*". The inference here would appear to be that one must at least be considerate of the opportunistic nature of pike before drawing conclusions to support a theory that pike prey preferentially on any species, including trout.

Table 1. Total numbers of fish captured in survey nets and total number of trout and roach in pike stomachs, from the March gill netting surveys of L. Sheelin, 1980 - 2007

Table 1.	Survey date	1980	1981	1983	1986	2000	2001	2002	2003	2004	2005	2006	2007
	Fish species					9.0455	0.000	12000				1910-00	1.00
Total No.of fish captured in survey nets	Wild Trout	162	220	90	67	8	4	11	10	7	22	28	4
	Roach	3	18	97	2361	735	611	824	1492	485	47	28	44
	Survey date	1980	1981	1983	1986	2000	2001	2002	2003	2004	2005	2006	2007
_	Fish species			-	_								
Fotal No. of fish in place stomachs	Wild Trout	6	25	5	S <b>4</b> S	2	2	2	÷.	0	2	ा	1
	Roach	O	0	2	9	11	34	7	5	7	4	6	6

Excerpt from "The Ecology, Biology and Management of Pike in Irish Waters with Particular Reference to Wild Brown Trout Lake Fisheries" O'Grady & Delanty (2008) Further evidence of the dependency of a pike population on fish other than trout is illustrated in the following bar graph that was presented to the pike policy review group in 2011. It can be seen that as perch and roach population densities increase and decrease, pike population density follows, yet trout density has remained constant through the same cycles. If pike fed preferentially on trout then the variance in population density rather than roach, perch or others.

Another interesting observation is that it appears that, during periods of high densities of roach in particular trout densities show a marked depression. This would appear to indicate that the population dynamics of all species, and indeed the environmental drivers that naturally dictate species reproduction and survival, are inextricably linked, and as such are critical for inclusion within the context of 'population modelling'.

It is quite clear that the bio-manipulation of pike stocks as part of a pike management policy could have deeper unintended consequences for all species, and in fact be counterproductive when one considers population fluctuations in response to environmental, habitat and other changes within eco-systems.



### Excerpt from "The Necessity for Controlling Pike Stocks in Some Quality Irish Wild Brown Trout Managed Lake Fisheries" O'Grady et. al. (2011)

Another misconception that has featured highly in pre-Pedreschi *et al.* (2014) studies is that pike do not feed on pelagic (i.e. suspended over deep water) prey or prey positioned in benthic (bottom) zones. This argument was used to reinforce the assumption of a pikes preference for trout even in waters that contain an abundance of cyprinids, perch and other prey species. The studies centred on the conclusion that pelagic or benthic "positioned" prey were unavailable as food for pike for large portions of the year as pike hunted primarily in shallow-water zones, preferring a hunting habitat of charophyte beds.

In fact, large prey shoals will for long periods of the year lie in, or suspend over very deep water. Pike anglers' experiences over many years and in many fisheries in Ireland and Europe contradict the above assumptions that pike do not feed pelagically. In fact, pike will readily feed in pelagic and benthic zones, necessitating the need for tackle manufacturers to develop specialised equipment required to target those pelagically-feeding pike. As a consequence, numbers of large specimens are caught using pelagic / bottom-fishing techniques. Angling records show that the highest numbers of larger pike are caught in deeper areas year on year through a varied range of fisheries.

Document No.: P160301/030/001
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# 6.2 DEFICIENCIES IN SAMPLING, CALCULATION AND DATA GATHERING METHODOLOGY RELATING TO THE STUDY OF PIKE DIET IN IRELAND PRE 2012

The most recent IFI position document used to support pike management is O'Grady & Delanty (2008). The following Sections will detail a number of deficiencies in data gathering, research and supporting evidence contained in that position document, which continues to be used to support pike management in Ireland.

## 6.2.1 PEER REVIEW

Prior to the release of the ground breaking research i.e. the "Genetic Structure of Pike and their History in Ireland" Pedreschi *et al.* (2014) and the "The Diet of Pike in Irish Watercourses" Pedreschi *et al.* (2014), both of which are internationally peer-reviewed, there was a dearth of peer reviewed scientific studies in Ireland. It remains a considerable concern that many of the reports produced by or in collaboration with IFT, CFB and IFI relating to Irish pike origins, diet and pike management policy were not internationally peer-reviewed scientific research studies, but were in-house studies and position documents reflecting the opinion of the authors. In contrast to the vast wealth of international knowledge available, Ireland has continued to base policies upon such studies, which is an unacceptable position in the present day. Examples of the wealth of international research information that has been available can be found in the "Synopsis of Biological Data on the Northern Pike: Esox Lucius" Food and Agricultural Organisation of the United Nations (1988) and Pike, biology and exploitation by Craig, J.F. (1996).

## 6.2.2 STABLE ISOTOPE ANALYSIS AND STOMACH CONTENT ANALYSIS

Pre Pedreschi *et al.* (2014b), Stable Isotope Analysis (SIA) was not used in the study of pike diet in Ireland. As described in Section 7.1.1, SIA provides a much more accurate representation of what a pike consumes over a longer period of time, thus eliminating the deficiencies in stomach content analysis (SCA).

Pre 2014 Stomach Content Analysis (SCA) was the only method used to establish what a pike consumes. As described in Section 7.1.1 SCA is not a suitable method to ascertain what a pike feeds on over a long period of time. SCA provides just a snap-shot in time of what a pike has recently consumed and is currently digesting.

The following Sections illustrate some historical examples of the failings of SCA over time and the erroneous conclusions drawn from past research. References are also made to the variance by different scientific staff and excessive and arguably unsupported overestimates of pike food consumption.

## 6.2.2.1 HEALY (1956):

O'Grady & Delanty (2008), Section 2.8, refer to the findings of Healy (1956) as supporting evidence for the dominance of trout in the diet of pike in Lough Glore during studies undertaken between 1951 and 1954, *"despite the presence of a large perch stock"*.

The size of the perch stock at that time should be put into perspective. Healy (1956) states not that there is a large perch stock, but that there *"should be an adequate supply of perch"*. Healy (1955) also states that in 1951 an estimation of the adult perch stock in Lough Glore was 13,400 fish, 53% of which was removed during 'the scheme for the reduction of coarse fishes' by the end of 1953. Total perch removal from Lough Glore (1950-1954) was 11,504 adults, 407 yearlings, 1,817 perch fry and *"innumerable"* perch eggs.

This perch removal should be viewed against a backdrop of existing and supplemented trout stocks during the same period. Healy (1955), states that when coarse fish removal operations commenced on Lough Glore, *"large numbers of big trout were netted"*. Healy (1955) also states that during the same operations period that *"the main spawning stream at Lough Glore has been stocked with 250,000 fry from Lough Owel"*.

The inference here is that, as Lough Glore already contained large numbers of big trout prior to pike management operations, it is only reasonable that a bio-manipulation of fish stocks by removing perch and by adding trout fry that may migrate into Lough Glore, would logically lead to an outcome where trout predation would be inevitable.

The bio-manipulation of fish stocks in Lough Glore, between the years 1951 and 1955 has not been commented on in O'Grady & Delanty (2008).

### 6.2.2.2 TONER (1959):

O'Grady & Delanty (2008), Section 2.8, refer also to the findings of Toner (1959). Toner states in his research into the food of pike in Lough Corrib, that *"1,170 pike weighing nearly 5.5 ton, were calculated to have eaten over 46 ton of trout and 11 ton of coarse fish in one year"* (1954). An alternative analysis of Toner's (1959) findings follows:

### 1. The Maintenance Ratio:

Pike in Your Waters (2003) noted that the dietary requirements of pike are considered predictable and have been studied by several authors (e.g. Kipling & Frost 1970). It was stated in general terms that a diet comprising between 13oz-11b of prey fish per pound of pike per annum is needed to merely keep the pike alive (the 'maintenance ration'). Pike in Your Waters (2003) noted that Johnson (1966) listed an average figure equivalent to 1.4lb/lb/year, with a range of 1.3-1.8, whereas Mann (1982) reported an annual value of 0.8/g/g. Fitzmaurice (1983) suggests a significantly higher 'maintenance ration' for pike of "less than 5:1", however Fitzmaurice does not cite any author nor provide any clear evidence in the paper for this conclusion.

### 2. The Food Conversion Ratio:

Pike in Your Waters (2003) noted that conversion from prey flesh to pike flesh can also be predicted, and suggested the ratio between weight gain and total food consumed during normal growth is often between 1:5 and 1:10. It was further noted that Popova (1978) listed a figure of 1:8.8 and Mann (1982) calculated a ratio of 1:6.6. Fitzmaurice (1983) noted that Johnson (1966a) under experimental conditions obtained a gross conversion factor of 3.4:1 for immature pike. It was further noted that on the basis of including gonadal production for mature pike Johnson (1966b) assumed a figure 84% for both sexes yielding a 'gross conversion' for mature pike of 6.27:1. It is worth commenting at this point that O'Grady *et Al.*, (1996) used Johnson's (1966) gross conversion factor, corrected for gonadal production (i.e. 6.27:1) in order to calculate the weight of fodder fish consumed by an estimated pike population in Lough Corrib in 1995.

### 3. Alternative Analysis of Toner (1959) Total Pike Food Consumption:

To analyse the projected food consumption of the 1,170 Lough Corrib pike discussed by (Toner 1959), a similar growth rate to that found in O'Grady *et al.*, (1996) has been assumed, as in both cases the pike stocks are considered to represent an undisturbed pike population. An approximate average weight of 4.776kg for each of the 1170 pike is calculated by converting "5.5 tons" (UK, Long) to kilograms. Using both the regression calculation for length / weight relationship (O'Grady *et al.*, 1996, Page 11) and interpolating the growth pattern graph (O'Grady *et al.*, 1996, Page 61, Fig. 26a) for pike in Lough Corrib in 1996, it is determined that each pike of average weight 4,776 grams would each have a total length of 78.3cm. Using the same method, is it possible to back-calculate the average weight and length for the same pike, at an age one year earlier. This yields an average weight of 3,377 grams and a length of 70.8cm or an average weight increase for each pike of 1390 grams (1.39kg) for the year.

### 4. Calculation:

Using Johnson's (1966) 'Maintenance' and 'Food Conversion' ratios of 1.4lb/lb/year and 6.27:1, respectively, the following total calculations for one year's food eaten to effect a weight gain of 1.39kg per fish for the entire 1,170 pike are made:

(1170 x 1.39 x 6.27) + (1170 x 4.776 x 1.4) = 18,020kg

Converting 18,020kg to tons (UK, Long) = 17.7 ton

### 5. Conclusion:

The calculations above conclude that the 1,170 pike referred to by Toner (1959) would probably have eaten only 17.7 tons of food. This figure represents a significantly lower food intake, i.e. 31% of Toner's (1959) estimation. The analysis of Toner's (1959) data in the manner performed may have its limitations; however, it is significant, as it nevertheless serves to show the extent of overestimation that appears to exist in Toner's work.

It is noteworthy with respect to Toner's (1959) estimations that it is stated in O'Grady (1995), that *"the food of pike in Irish waters, apart from Healy's (1956) and Toner's (1959) pioneering work was examined in great detail"*. It would seem that the continued use of this work as corroborating evidence for Inland Fisheries Ireland's pike management policy serves to mislead with respect to the dietary habits of pike. It should be further noted that Healy (1956) refers to an Inland Fisheries Trust report of 1954 stating that 80% (i.e. 936) of the 1,170 pike examined from Lough Corrib for the period March to June 1954 had empty stomachs.

One further comment on Toner's (1959) estimate of pike food consumption is that it represents an average yearly intake exceeding 1000% of the weight of the pike examined. In contrast, Rudzianskiene G. (2001) examined the diet of 257 pike in the Curonian Lagoon, Lithuania, and calculated that the average yearly ration of pike made 243-266% of its total body weight. The current calculation of 31% of Toner's estimate may therefore be high.

### 6.2.2.3 O'GRADY ET AL. (1996):

O'Grady *et al.* (1996) estimated that the Lough Corrib pike population in 1995 alone ate over 255,000 trout weighing over 118 tonnes. This study was used to support a broader funding application as part of the 'Tourism Angling Measure' (TAM) at that time, part of which was to include the removal of pike from Lough Corrib.

The estimated calculation of trout eaten relied upon a number of assumptions, including the following:

- that the population of pike in Lough Corrib in 1995 was calculable by applying an estimate for the pike population on Lough Sheelin based on CPUE's and lake surface area, and applying this estimate to the CPUE's and lake surface area of Lough Corrib;
- that the diet of pike in Lough Corrib during 1995, did not change seasonally;
- that the biomass of trout to roach (i.e. 80% 20%) found in pike stomachs in the 1996 Lough Corrib stock survey, was constant for the entire year, 1995;

The calculation of the pike population on Lough Corrib for the year 1995 in the manner performed above, without using supportive mark-recapture techniques to verify the calculation, continues to be a questionable foundation for the estimated 118 tonnes of trout eaten in 1995.

O'Grady *et al.* (1996) calculated the predation of pike on trout in Lough Corrib for 1995 by assuming that pike diet during 1995 did not change seasonally. Section 8 discusses possible factors influencing seasonal feeding and its lack of consideration in scientific reports.

Of note however, is that O'Grady *et al.* (1996) did recommend a study into the seasonal diet of pike on Lough Corrib, presumably to ascertain the accuracy of the original assumption. It is discussed in section 9.4.1.3 that the recommended study was not undertaken by the Central Fisheries Board, nor was it undertaken subsequently by Inland Fisheries Ireland.

The attached excerpt dated 1988, indicates just how seasonally diverse the diet of pike can be expected to be. This information would have been available to the Central Fisheries Board in 1996.

Front (1954) and Lauler (1905) found that sessinal charges in the dist of the pite ap-pearad to be related to the availability of the fish food. Different species composition in different waters remains in diverging pine dists. Lawler (1963) reports that the most INPLANT FRMA types saten to each pl 1.00 Several. periods during the year is Masting Lake are: PAS and June - trout-parets (Enroyals amiscinarcus) July - spotcall shiner (Notropals Redsontus) August to September - yellow perch (Perca flave-scenn); October to March - sticklebacks (Pun-Sodsonius); gitius pungitius and Eucalia inconstans). In Windermare (Front, 1854), perch (Perra fluriasizze) eccut to the pite dist at all predecipate itos May to October. Char ( linus willughbil) are eaten only in Novem Char (Salveter and December, brown trout (Salmo trutta greater extent from October to February. 5.0 trutta) Stick-Jebecks (Gasterosteus aculestus) and minnous (Mhominus phominus) are taken in spring and (Micelson phorizon) are called are examinated with the changes to babits of the food specter.

Excerpt from "Synopsis of Biological Data on the Northern Pike:Esox Lucius" Food and Agricultural Organisation of the United Nations (1988)

Finally, it should be noted that 461 pike were captured during the Spring stock survey on Lough Corrib in 1996. Of the 461 pike captured, 43 pike (i.e. 9%) were recorded as containing trout (FOI/104/07/C). It is the biomass hypothesis that feeds into the considerable tonnage estimate for trout eaten compared to other species. Pedreschi (2014) commented as follows on stomach data regarding trout in pike stomachs in 2011, *"Trout were encountered in five sites (9 stomachs), and were only important in Lough Sheelin in 2011 (17% IRI), where despite a low occurrence rate of only 7%, their weight contribution to the diet was 48%. This was primarily due to two large relatively undigested trout, highlighting the bias when using only stomach contents". It is not the intention here to take the findings of Pedreschi (2014) out of context, however, it is clear that Pedreschi (2014) was aware that biases are possible when using data obtained from stomach content analysis. Regarding the general estimate of 118 tonnes of trout eaten in 1995, a full review of this figure was requested from Inland Fisheries Ireland scientific staff in a high level-meeting with the Irish Federation of Pike Angling Clubs in April 2009. A further request was made by the Irish Pike Society in April 2016 in relation to same.* 

To date, a full analysis of the methodology and assumptions used to support this tonnage is still awaited from Inland Fisheries Ireland.

## 6.2.3 TIMING OF SAMPLING

The method of Stomach Content Analysis (SCA) was the primary method (pre Pedreschi *et al.* (2014)) used to establish what a pike had consumed. As SCA provides only a snap-shot in time of pike consumption, the timing of sampling becomes critical, hence the actual sample timing of pre-2014 pike diet results in severe flaws with respect to previous IFI research.

Pre-2014 SCA was in most cases undertaken on pike caught in gill-nets or by electrofishing during annual pike management operations that occur when pike are spawning on "designated wild brown trout fisheries". Pike spawn in shallow bays that predominantly have small rivers or feeder streams entering them, and hence migrate from deep water to these habitats in numbers from late December. Whilst in deep water, pike are feeding predominantly on pelagic or benthic positioned species such as roach, perch, bream and hybrids. Prior to spawning, pike feed more often in order to build condition in preparation for the rigours of spawning. As pike begin spawning as early as late January, the increased food intake usually occurs between October and January.

Trout spawn in many of the small rivers and feeder streams that flow into pike spawning bays. The migration of trout to their spawning rivers and streams usually occurs around November. When spawning is complete, trout migrate back to the lake and re-enter the shallow bays. According to IFI studies, the now spawned trout can stay in the vicinity for quite some time after spawning before dispersing later back into the main body of the lake - O'Grady & Delanty (2012).

2. Most trout migrating to the lake appear to stay in areas near the outfall of

their natal river in springtime.

### Excerpt from "A Survey of Adult Fish Stocks in Lough Corrib" O Grady et al. (2012)

There is now a period where numbers of pike that are feeding prior to spawning and numbers of fatigued postspawn trout are in close proximity for a short period of time. At this time, trout - amongst other species - are consumed in small numbers by pike. However, as pike are gillnetted or electrofished very shortly after this time, it is reasonable to assume that SCA only will show that most specimens sampled with food in their stomachs will contain some trout.

At this time of year there is a large timeframe between when a pike consumes a food item and when that item is evacuated (digested) out of the stomach. Water temperatures at this time of year are typically between 2 deg.C and 6 deg.C. Pike metabolism is, like many fish species, determined by their surrounding water temperature, and therefore gastric evacuation can take weeks at this time of year. According to research by Diana (1979a) contained within the **"Synopsis of Biological Data on the Northern Pike: Esox Lucius" - Food and Agricultural Organisation of the United Nations (1988),** the time between meals for pike in January is between days. If a pike consumes a trout in this period, Diana's data highlights how infrequent this occurrence is in this period, and also how wide the window of opportunity is in relation to finding a trout in a gillnetted pike.

Subsequently, the timing of most previous SCA analysis undertaken leads to error, as trout will appear significantly more often in pike diet at this time of year than any other. The assumption that this dietary pattern is constant throughout each year further compounds the errors in past analysis of Irish pike diet.

Time period	Sex	Meal size (kcal/kg)	Time between meals (days)	Daily ration (kcal/kg day)
Мау	Male Female	30.4 32.4	3.1 2.3	9.6 14.0
June	Male Female	35.0	1.9 2.2	18.1 30.9
July	Male Female	36.5 54.1	2.1 2.8	11.5
August	Male Female	23.1 25.4	3.8	6.0 9.8
September	Male Female	22.5 31.4	3.5	6.4
October	Male Female	17.4	2.2	7.9
January	Male Female	9.8 22.0	34.0 23.0	0.3
March	Male Female	10.9 21.6	22.0 26.0	0.5
April	Male Female	14.8 14.8	59.0 59.0	0.3
Winter	Male Female	10.6 21.8	25.0	0.4
Summer	Male Female	30.8 47.0	2.8 2.7	11.4 17.4

### Daily various of northern pixe for various time-periods sampled during 1976-78 in Lac Sainte Anne (Diana, 1979a)

Excerpt from "Synopsis of Biological Data on the Northern Pike: Esox Lucius" - Food and Agricultural Organisation of the United Nations (1988)

To date there has been no intensive study into the seasonal variation of pike diet in Irish fisheries. This has arguably resulted in pike management policy being formulated on the basis of SCA conducted at a time that favours the detection of trout in a pike's diet. The most recent research on the diet of Irish pike by Pedreschi *et al.* (2014) recognises and highlights this failing by stating:

"Research should continue to investigate stomach contents on a longer-term sampling plan to see if they better reflect SIA values, and to build stronger estimates of individual specialisation and diet overlap. Sampling using a dedicated plan rather than opportunistic sampling would also facilitate a wider range of analyses and hypothesis testing, including, for example, comparisons between seasonal variations in diet."

# 6.2.4 SAMPLING ANOMALIES WITH PARTICULAR REFERENCE TO LOUGH SHEELIN (1978 TO 2006)

Using the Freedom of Information legislation in 2008, a 31-year period of raw data from the Lough Sheelin annual stock surveys, which are conducted in March each year, was requested. A 29-year window from 1978 to 2006 is examined in this section, as this particular timeframe is referenced in several documents produced by Inland Fisheries Ireland (See Section 6.1).

The Central Fisheries Board, now Inland Fisheries Ireland, received €500 from the Irish Federation of Pike Angling Clubs for the Freedom of Information request (Ref: FOI/145/08/C). The information provided appeared to be missing significant portions of data, therefore an appeal was forwarded to the Central Fisheries Board in respect of this. The response to the appeal confirmed that "a full review of the information provided" had taken place and "that no additional information is available". It is on the basis of the confirmation that there is no outstanding information, that the review of FOI/145/08/C is conducted in this section as follows.

Pike diet over the 29-year timeframe 1978 to 2006 is examined for:

- Pike >60cm in length;
- Pike from 40cm to 59.9cm and
- ➢ Pike <40cm in length.</p>

The above size parameters are chosen and examined here to allow the reader to consider the validity - or otherwise - of the bedrock of research on pike diet used by Inland Fisheries Ireland, to support pike management.

FOI/145/08/C shows that during the 29-year timeframe 2315 pike were captured during the annual Spring surveys. 1716 (i.e. 74%) are recorded on the received data sheets, therefore the remaining 599 pike are, for reasons unknown, excluded from the data sheets. Of the 74% of pike recorded, 22% had food in their stomachs. Of the 22% recorded as having food in their stomachs, 12% were found to contain wild trout, therefore 88% of those stomachs containing food contained something other than wild trout. The basic fact is that percentages alone only tell part of the story. For example, it is a fact that the FOI response indicates that only 46 pike captured in 29 years during the Lough Sheelin Spring surveys are recorded as having eaten wild trout. As stated, this data is the bedrock for pike management in Ireland.

It is considered that the data available for Lough Sheelin between 1978 and 2006 represents the largest collated data base of all Irish fisheries. However, FOI/145/08/C illuminates many failings in that data as a longitudinal study. The examination of FOI/145/08/C, which is presented in the following tables and pie charts, represents the actual raw data base from which Inland Fisheries Ireland draws conclusion with regard to the dietary habits of Irish pike living in fisheries along with wild trout. The data base is based upon a 'snap-shot' look into pike feeding habits at a particular time of year.

The research is conducted with gill-nets, which are known to induce regurgitation of food by fish captured in the nets. There is little evidence to suggest that the research considers external factors such as seasonal spatial distribution of species. Furthermore, the research is not backed up by a corroborating scientific methodology; e.g. Stable Isotope Analysis. To our knowledge, the conclusions stemming from this data base have never been internationally peer reviewed.

It is incumbent on the scientific information that continues to support a pike management strategy in Ireland, costing the Irish Exchequer millions of euros to sustain, to be clear, concise and infallible. The following overview seeks to examine that scientific information.

FREEDOM OF INFORMATION REQUEST FOI/145/08/C - STOMACH SAMPLING DATA FOR PIKE >60CM IN LENGTH (1978-200											78-2006)	
		No. of	of No. of Pike Stomachs Containing a Particular Food Sample									
	Annual	Pike										
	Spring	Recorded		E a mar a d							Blank	
Voor	Survey	On Data	Trout	Farmed	Dorch	Boach	Diko	Romains	Othor	Empty	(INO Data)	
1079		0	nout	nout	Feich				Other	Linpty	Dataj	
1978	T V	7	1	2					1		2	
1020	r V	16	2	1					1		11	
1001	v v	22	0	1	2		1		1	1	20	
1002	I V	52	5	No data i	2 provided fr		ioc with th	o ovcontion	oftrout		20	
1962	T V	40	2		11					15	12	
109/	v	12	5	Diko ciz		2 o niko stor	nach samn	ling data av	ailablo	15	12	
1095	T V	12		FIRE SIZ	No da	ta provido	d for any s		allable		12	
1965	T V	10	1		2			pecies		12	0	
1007	I V	19	1		No da	ta provido	d for any c	nocios		12	0	
1000	r V				No da	ita provide	d for any s	pecies				
1900	T V	0		Diko ciz		la piko stor	u lui dily s	ling data av	ailabla		0	
1909	v v	9		Pike sizes only - No pike stomach sampling data available								
1990	T N	9		FIKE SIZ	es only - N	No appu		ing uata av	allable		9	
1002	N V	17		Diko siz	es only - N	o nike stor	ai sui vey	ling data av	ailablo		17	
1002	r V	10		Pike Siz		o piko stor	nach samp	ling data av			10	
1995	v v	17		Pike Siz		o pike stor	nach samp	ling data av			17	
1005	v	10		Diko siz	es only - N	o nike stor	nach samp	ling data av	ailable		10	
1006	v	27		Diko siz	es only - N	o pike stor	nach samp	ling data av	ailable		27	
1997	N	21		FIRE 312	es only - N	No annu	al survey	ang uata av	anabie	_	27	
1998	N					No annu	al survey					
1999	v	37		Pike siz	es only - N	o nike stor	nach samn	ling data av	ailahle		37	
2000	Y Y	46	2		7	7		6	11	12	1	
2001	Ŷ	60	1		7	6			3	32	11	
2002	Y	39	3		1	6			2	10	17	
2003	Ŷ	79	1			3		1	2	20	52	
2004	Ŷ	31				4		_	2	23	2	
2005	Y	33		Pike siz	es only - N	o pike stor	nach samp	ling data av	ailable		33	
2006	Y	27			7	3				12	5	
тс	DTAL	595	24	3	38	35	1	7	28	137	324	

# 6.2.4.1 DATA REVIEW FOR PIKE > 60CM IN LENGTH (1978-2006):

Note: Two stomachs are recorded twice - i.e. one containing perch and trout; one containing perch and roach. On an appeal of FOI/145/08/C, the considerable blank columns on the stomach content data sheets was queried, to which a response was received from the Central Fisheries Board (now Inland Fisheries Ireland), to advise upon capture, that *"pike often evacuate their stomachs"* and that *"blank columns reflect empty stomachs"*.
## COMMENT ON FOI/145/08/C STOMACH CONTENT DATA FOR PIKE >60CMS:

- Inland Fisheries Ireland refers to a sampling period 1978 to 2006. In fact, FOI/145/08/C shows that stomach content data is available for only 11 of those 29 years, i.e. 1979, 1980, 1981, 1983, 1986, 2000, 2001, 2002, 2003, 2004, 2006 (i.e. totalling 405 pike over 60 cm in length).
- There are a further 190 pike >60cm recorded for the years 1984, 1989, 1990, 1992, 1993, 1994, 1995, 1996, 1999, 2005; however stomach sampling data is not provided for these 190 pike, which presumably, if available, would have been made available under FOI/145/08/C.
- No sampling data for any pike was provided for the years 1982, 1985, 1987, 1988, although it is known that a total of 325 pike were captured during the Spring surveys carried out in those years ref: FOI/145/08/C.
- Spring surveys were not carried out at all in 1991, 1997 and 1998.
- No pike >60cm in length was sampled in 1978; however, only 24 are recorded in all size parameters, of a total of 32 pike captured in the Spring survey ref: FOI/145/08/C therefore 25% are unaccounted for.

## STATISTICS FOR FOI/145/08/C STOMACH CONTENT DATA FOR PIKE >60CMS:



**FACT:** Between 1978 and 2006, FOI indicates that only 24 pike stomachs examined in the Spring surveys contained a wild trout!

## AMBIGUITY BETWEEN FOI/145/08/C AND INLAND FISHERIES IRELANDS' SCIENTIFIC DATA REPORTS:

- O'Grady & Delanty (2008) See Section 6.1 & O'Grady et al. (2008) both show that, for pike >60cm captured in the Spring surveys over 29 years, 324 pike were examined, of which 149 contained food. In contrast, FOI/145/08/C shows that in fact, of the 595 pike recorded on the FOI data sheets, only 134 are recorded as containing food. Therefore, the aforementioned documents both include an extra 15 stomachs that are unaccounted for under FOI/145/08/C. To put this into perspective, if one considers that only 24 stomachs in 29 years contained a wild trout, then 15 stomachs unaccounted for is a credible concern.
- Further to the above, a presentation made to the Pike Policy review group in November 2011 was entitled "The Necessity for Controlling Pike Stocks in Some Quality Irish Wild Brown Trout Managed Lake Fisheries". The presentation showed that for pike >60cm captured in the Spring surveys over 29 years, 324 pike were examined, of which 175 contained food - *See excerpt in Section 6.1*. Having discussed in the previous point that FOI/145/08/C proves that only <u>134</u> pike stomachs contained food, in this instance it is stated that <u>175</u> stomachs contained food, in contrast to the <u>149</u> stomachs stated in O'Grady & Delanty (2008) & O'Grady *et al.* (2008). The apparent further inaccuracy contained in the scientific information produced by Inland Fisheries Ireland raises increasing concern as to the general credibility of the information.

## 6.2.4.2 DATA REVIEW FOR PIKE 40CM TO 59.9CM IN LENGTH (1978-2006)

FRE	EDOM OF IN	FORMATION	REQUEST FOI	/145/08/C ·	- STOMA	СН ЗАМР		OATA FOR P	IKE 40CM TO	O 59.9CN	1 (1978-20	006)
	Annual	No. of Pike		No.	of Pike S	tomachs	Contair	ning a Parti	cular Food Sa	ample		
Year	Spring Survey Y/N	Recorded on Data Sheets	Wild Trout	Farmed Trout	Perch	Roach	Pike	S/Backs	Remains	Other	Empty	Blank (No Data)
1978	Y	20	2	4				4	1	3	6	0
1979	Y	25	1	16	1			2				5
1980	Y	45	3		1			1		10		30
1981	Y	64	11		4		1		1	3		44
1982	Y			No data p	provided	for any sp	oecies v	vith the exc	ception of tro	out		
1983	Y	144	2		35	1		1		20	28	57
1984	Y	60		Pike size	es only -	No pike s	tomach	n sampling o	data availabl	e		60
1985	Y				No d	data provi	ided fo	r any specie	es			
1986	Y	44	1		8	4				8	22	1
1987	Y			No data provided for any species								
1988	Y			No data provided for any species								
1989	Y	15		Pike sizes only - No pike stomach sampling data available						15		
1990	Y	27		Pike sizes only - No pike stomach sampling data available						27		
1991	Ν					No ar	inual su	irvey				
1992	Y	25		Pike size	es only -	No pike s	tomach	n sampling o	data availabl	e		25
1993	Y	40		Pike size	es only -	No pike s	tomach	n sampling o	data availabl	e		40
1994	Y	27		Pike size	es only -	No pike s	tomach	n sampling o	data availabl	e		27
1995	Y	92		Pike size	es only -	No pike s	tomach	n sampling o	data availabl	e		92
1996	Y	81		Pike size	es only -	No pike s	tomach	n sampling o	data availabl	e		81
1997	Ν					No ar	inual su	irvey				
1998	Ν					No ar	inual su	irvey				
1999	Y	45		Pike size	es only -	No pike s	tomach	n sampling o	data availabl	e		45
2000	Y	34			1	4				14	14	1
2001	Y	70			3	4		1		14	17	31
2002	Y	35			1	1				2	11	20
2003	Y	19				1	1			3	8	6
2004	Y	10				1				4	3	2
2005	Y	16		Pike size	es only -	No pike s	tomach	n sampling o	data availabl	e		16
2006	Y	16			5	1				3	5	2
٦	TOTAL	954	20	20	59	17	2	9	2	84	114	627

Note: Two stomachs recorded as roach contained unidentified cyprinid fry. Stomachs recorded as 'other' contained invertebrates, snails; some stocked farmed trout - i.e. over two years only, 1978/79, frogs, etc. On an appeal of FOI/145/08/C, the considerable blank columns on the stomach content data sheets was queried, for which a response was received from the Central Fisheries Board (now Inland Fisheries Ireland), to advise that upon capture, *"pike often evacuate their stomachs"* and that *"blank columns reflect empty stomachs"*.

## COMMENT ON FOI/145/08/C STOMACH CONTENT DATA FOR PIKE 40CM TO 59.9CMS:

- Inland Fisheries Ireland refers to a sampling period 1978 to 2006. In fact, FOI/145/08/C shows that stomach content data is available for only 12 of the 29 years, i.e. 1978, 1979, 1980, 1981, 1983, 1986, 2000, 2001, 2002, 2003, 2004, 2006 (totalling 526 pike of between 40cm to 59.9cm in length).
- There are a further 428 pike of between 40cm to 59.9cm recorded for the years 1984, 1989, 1990, 1992, 1993, 1994, 1995, 1996, 1999, 2005; however, stomach sampling data is not provided for these 428 pike, which presumably, if available, would have been made available under FOI/145/08/C.
- No sampling data for any pike was provided for the years 1982, 1985, 1987, 1988, although it is known that a total of 325 pike were captured during the Spring surveys carried out in those years ref: FOI/145/08/C.
- Spring surveys were not carried out at all in 1991, 1997 and 1998.

## STATISTICS FOR FOI/145/08/C STOMACH CONTENT DATA FOR PIKE 40CM TO 59.9CMS:



**FACT:** Between 1978 and 2006, FOI indicates that only 20 pike stomachs examined in the Spring surveys contained a wild trout!

## AMBIGUITY BETWEEN FOI/145/08/C AND INLAND FISHERIES IRELANDS' SCIENTIFIC DATA REPORTS:

Inland Fisheries Ireland (2011) - See excerpt Section 6.1, O'Grady & Delanty (2008) and O'Grady et al. (2008) show that for pike from 40cm to 59.9cms captured in the Spring surveys over 29 years, 386 pike were examined, of which 122 contained food. FOI/145/08/C shows that 954 pike are recorded on the data sheets, of which 213 are recorded as containing food. This anomaly represents the significant difficulty one is presented with when trying to examine and analyse pike dietary data provided by Inland Fisheries Ireland.

As mentioned previously in this section, only 74% of the pike captured in the 29 years during the Spring surveys are actually recorded in the FOI/145/08/C data sheets. Therefore, it is the contention of this document that the pie chart above represents the most accurate overview of the research data base for pike from 40cm to 59.9cms.

6.2.4.3 DATA REVIEW FOR PIKE <40CM IN LENGTH (1978	8-2006)
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FREED		FORMATION	N REQUES	T FOI/145,	/08/C - S	TOMACI		IG DATA FO	OR PIKE <4	OCM IN LENG	тн (1978	-2006)
					No. of	Pike Stor	nachs Cont	aining a Par	ticular Food	d Sample		
	Annual Spring Survey	No. of Pike Recorded on Data	Wild	Farmed								Blank (No
Year	Y/N	Sheets	Trout	Trout	Perch	Roach	S/Backs	Remains	Asellus	Gammarus	Empty	Data)
1978	Y	4			1		3					
1979	Y	1										1
1980	Y	7							2	1		5
1981	Y	5							1	1		4
1982	Y			No	data pro	vided for	any specie	s with the e	ception of	trout		
1983	Y	13			1				1	1	3	7
1984	Y	1		Р	ike sizes	only - No	pike stoma	ch sampling	g data availa	able		1
1985	Y					No data	provided t	for any spec	ies			
1986	Y	14	2			1		1	4		4	2
1987	Y					No data	provided	for any spec	ies			
1988	Y			No data provided for any species								
1989	Y	0		Pike sizes only - No pike stomach sampling data available							0	
1990	Y	12		Р	ike sizes	only - No	pike stoma	ch sampling	, data availa	able		12
1991	Ν						No annual	survey				
1992	Y	10		Р	ike sizes	only - No	pike stoma	ch sampling	g data availa	able		10
1993	Y	11		Р	ike sizes	only - No	pike stoma	ch sampling	g data availa	able		11
1994	Y	15		Р	ike sizes	only - No	pike stoma	ch sampling	g data availa	able		15
1995	Y	13		Р	ike sizes	only - No	pike stoma	ch sampling	g data availa	able		13
1996	Y	14		Р	ike sizes	only - No	pike stoma	ch sampling	gdata availa	able		14
1997	Ν						No annual	survey				
1998	Ν						No annual	survey				
1999	Y	4		Р	ike sizes	only - No	pike stoma	ch sampling	data availa	able		4
2000	Y	5						1	3		1	
2001	Y	3							1	2		1
2002	Y	4							1			3
2003	Y	19				1			3	1	2	12
2004	Y	5				2		1			1	1
2005	Y	6		Р	ike sizes	only - No	pike stoma	ch sampling	data availa	able		6
2006	Y	1			1							
т	OTAL	167	2	0	3	4	3	3	16	6	11	122

Note: Three stomachs are recorded twice i.e. each contained both Asellus and Gammarus. On an appeal of FOI/145/08/C, the considerable blank columns on the stomach content data sheets was queried, for which a response was received from the Central Fisheries Board (now Inland Fisheries Ireland), to advise that upon capture, *"pike often evacuate their stomachs"* and that *"blank columns reflect empty stomachs"*.

- Inland Fisheries Ireland refers to a sampling period 1978 to 2006. In fact, stomach content data was provided for only 12 of the 29 years, i.e. 1978, 1979, 1980, 1981, 1983, 1986, 2000, 2001, 2002, 2003, 2004, 2006 (totalling 81 pike <40cm in length).</p>
- There are a further 86 pike <40cm recorded for the years 1984, 1989, 1990, 1992, 1993, 1994, 1995, 1996, 1999, 2005; however, stomach sampling data is not provided for these 86 pike, which presumably, if available, would have been made available under FOI/145/08/C.</p>
- No sampling data for any pike was provided for the years 1982, 1985, 1987, 1988 although it is known that a total of 325 pike were captured during the Spring surveys carried out in those years - ref: FOI/145/08/C.
- Spring surveys were not carried out at all in 1991, 1997 and 1998.



## STATISTICS FOR FOI/145/08/C STOMACH CONTENT DATA FOR PIKE < 40CMS:

## AMBIGUITY BETWEEN FOI/145/08/C AND INLAND FISHERIES IRELANDS' SCIENTIFIC DATA REPORTS:

Inland Fisheries Ireland (2011) - See excerpt Section 6.1, O'Grady & Delanty (2008) and O'Grady *et al.* (2008) show that for pike from < 40cm captured in the Spring surveys over 29 years, 67 pike were examined, of which 51 contained food. FOI/145/08/C shows that 81 pike are recorded on the data sheets, of which 31 are recorded as containing food. This shows that each of the respective data reports refer to an additional 20 pike as containing food on top of those recorded on the FOI/145/08/C data sheets. This again questions the credibility of the research data presented.</p>

As mentioned previously in this section, only 74% of the pike captured in the 29 years during the Spring surveys are actually recorded in the FOI/145/08/C data sheets. Therefore, it is the contention of this document that the pie chart above represents the most accurate overview of the research data-base for pike from 40cm to 59.9cms.

## 6.2.5 THE FAILURE OF GILL-NETS AS A SAMPLING TOOL FOR PIKE DIETARY ANALYSIS

The analysis of pike diet relies on the capture of numbers of specimens, which has been achieved primarily by gillnetting during Pike Management Operations. There are many inherent flaws with this method of capture with respect to Pike dietary analysis.

As mentioned in section 6.2.4, only 22% of pike recorded in FOI/145/08/C data sheets contained food. For those remaining, 15% are recorded as empty and 63% are left blank. As stated, an appeal to FOI/145/08/C was initiated under Freedom of Information to Inland Fisheries Ireland (then Central Fisheries Board), to request clarification as to why stomach content columns were left blank. The response received stated that *"upon capture in a net, or by rod, pike often evacuate their stomachs"* and that *"blank columns reflect empty stomachs"*. The issues of 'empty stomachs' and the 'regurgitation of food' will be discussed in the following sections.

## 6.2.5.1 EMPTY STOMACHS

The 1978 to 2006 stock sampling took place in Spring, primarily, it appears, to coincide with the pike spawning period. Craig (1996) commented on the migration of pike to their spawning grounds, stating that some river pike travelled 15km to reach their spawning grounds. A spawning migration of pike would likely lead to them being susceptible to capture in survey nets. This spawning period, itself, has been linked to a spawning fast in pike. As such, it may be reasonable to suggest that feeding opportunism rather than selectivity is more likely.

Spring sampling can, by its very nature, allow increased capture of pike than can, for instance, summer sampling conducted under the Water Framework Directive, simply because of the previously mentioned migration. As such, Spring sampling may provide sufficient numbers of pike required to allow an examination of growth rates of individual pike and length frequency studies. Dietary studies are a different and more complicated matter.

Many authors - e.g. Dominguez & Pena (2000), King & Kirrane (1994), O'Grady & Delanty (2003) - link the spawning period to a large percentage of empty stomachs. Dominguez & Pena (2000) found up to 84% empty stomachs in February over six years from 1982 to 1987 in the Esla Basin. O'Grady & Delanty (2003) found 64% empty stomachs in Lough Arrow in 2002. However, empty pike stomachs in Ireland are disregarded in the analysis of pike diet, yet they clearly can represent a considerable unknown quantity. This unknown quantity allows assumptions to be made, based primarily on a small number of stomachs containing food (See Section 6.2.4). The assumption is then applied to the entire pike stock.

As discussed in Section 6.2.2.2, 80% of the Lough Corrib pike stomachs referred in Toner (1959) were empty, yet a projected pike diet for a whole year of over 1000% for 100% of the pike captured, was used as a basis to support the removal of pike. Furthermore, the data flowing from this projection continues to be used by Inland Fisheries Ireland today. The inference here is that the lack of available scientific data stemming naturally from empty stomachs during Spring, while uninformative, should not be disregarded or presumed.

## 6.2.5.2 REGURGITATION OF FOOD

In contrast to empty stomachs, the regurgitation of food by pike may be relevant in all dietary sampling, particularly when gill-nets are used, irrespective of the season. It is important to note that the dominant sampling method used in the 29-year sampling period on Lough Sheelin during 1978-2006 discussed in section 6.2.4 was gill-netting.

Treasurer (1988), Dominguez & Pena (2000) and Healy (1956) linked regurgitation of food from pike stomachs with being captured using gill-nets. Alternative techniques were promoted by Dominguez & Pena (2000) such as electrofishing and traps to study the diet of 4,362 pike in Northwest Spain, so as to reduce regurgitation. Treasurer (1988) linked high levels of regurgitation to gill-nets being set overnight and to water temperature, with up to 84% regurgitation found in pike during Summer sampling. It was further suggested that gill-netting is an unsatisfactory capture method, leading to a false estimate of empty stomachs. Treasurer (1988) also suggested that failure to critically appraise regurgitation may mislead, in respect of the predation on prey species.

Regarding the Spring surveys on Lough Sheelin, gill nets are set overnight, and the likelihood of regurgitation is therefore scientifically supported. Although there appears to be no evidence to suggest that Inland Fisheries Ireland has in the past considered the bias of using gill-nets and the resultant regurgitation in the examination of the results, there does now appear to be some acknowledgement that gill-nets do lead to biases. Delanty *et al.* (2016) state in relation to a fish stock survey of Lough Ree carried out in 2014, *"that many of the pike examined had no food in their stomachs"*. It was stated that *"this is a common feature of pike caught in gill nets. Many of these fish tend to regurgitate their stomach contents when caught in a net".* 

In contrast to Inland Fisheries Ireland's theory that pike feed selectively on trout, Pedreschi (2014) has provided ground-breaking scientific evidence that pike are 'opportunist feeders'. This evidence is based principally upon a scientific technique known as 'Stable Isotope Analysis' (SIA). Paradis *et al.* (2008) discuss the merits of combining Stable Isotope Analysis and 'snap-shot' data in their research. To date, and since 1978, Inland Fisheries Ireland has relied solely on 'snap shot' stomach sampling by capturing fish principally in gill-nets.

The inference here is that the current body of research data into the diet of Irish pike, which has been collected over many decades, has relied principally upon gill-nets to provide that research data - a technique which is clearly inherently flawed.

## 6.2.6 SECTION SUMMARY CONCLUSION: PAST RESEARCH RELATED TO THE DIET OF IRISH PIKE

It is clear that the study of Irish pike diet prior to the modern research of Pedreschi *et al.* (2014) was inherently flawed due to a number of factors. The investigation and analysis undertaken in section 6 suggests that the scientific research currently supporting pike management in Ireland is based largely upon inaccurate data collation and representation, flawed sampling techniques, and arguably exaggerated conclusions supporting a theory that pike have a preference for feeding on trout.

In Section 6.1 the current Inland Fisheries Ireland position paper is discussed i.e. **"The Ecology, Biology and Management of Pike in Irish Waters with Particular Reference to Wild Brown Trout Lake Fisheries"** O'Grady & Delanty (2008). It is the contention of this document that this position paper inaccurately assumes that pike do not feed pelagically and that they will target trout over any other species, even when other species are significantly more available and accessible to pike as food.

With regard to the study of the diet of pike on Lough Sheelin (1978 – 2006), there is an unquestionable anomaly with regard to how this information is presented in a number of different papers produced by Inland Fisheries Ireland and its predecessors and the actual factual data obtained for that period using Freedom of Information legislation. There is no correlation between the data, and the credibility of the data is therefore open to question.

Of considerable concern is that the **"The Ecology, Biology and Management of Pike in Irish Waters with Particular Reference to Wild Brown Trout Lake Fisheries"** O'Grady & Delanty. (2008), is not an internationally peer-reviewed paper, as appears to be the case with many pike-related position papers and pike dietary studies undertaken by Inland Fisheries Ireland and its predecessors IFI prior to Pedreschi *et al.* (2014).

Regarding O'Grady *et al.* (1996), the resulting estimates of the predation of pike upon trout continue to be presented by Inland Fisheries Ireland as justification for removing pike, yet this estimate relies upon unsubstantiated assumptions. Furthermore, this paper again is an internal report, and the methodology, assumptions relied upon, and calculations have not been subjected to international peer review. It is notable that Inland Fisheries Ireland have not responded to requests for clarification regarding this paper.

Stomach Content Analysis is recognised as having limited applicability in relation to establishing dietary habits, as it can only provide a snap-shot in time of what has been consumed, providing the stomach contents have not already been digested, or ejected. The susceptibility of weakened or dead post-spawning trout to opportunistic pike predation during the Spring sampling periods remains a distinct possibility that has not been studied by IFI. In addition, the absence of a study undertaken by IFI and its predecessors into seasonal variations in pike diet as recommended in O'Grady *et al.* (1996) represents a significant failing with regard to advancing knowledge regarding Irish pike.

Considering all of the above, there appears to be considerable evidence to suggest that the validity and accuracy of the past research into the diet of pike is open to question, and as such is difficult to describe as acceptable. Furthermore, the use of past research data as a foundation for future scientific studies will likely have a negative impact on the reliability of those studies.

## 7 CURRENT RESEARCH RELATED TO THE DIET OF IRISH PIKE

A cornerstone of justification for pike management operations is that pike predominantly target and predate on salmonids, even where other prey species are available and more abundant. Recent research has shown this to be unfounded and revealed a number of flaws in the methodology and findings of over six decades of research undertaken by IFT, CFB and IFI relating to the diet of Irish pike.

## 7.1.1 THE DIET OF PIKE IN IRISH WATERCOURSES

In 2014, a PhD study was undertaken by University College Dublin in collaboration with IFI in order to accurately analyse the diet of pike. The report **"The Diet of Pike in Irish Watercourses"** - Pedreschi *et al.* (2014) highlighted many new characteristics related to pike diet, feeding habits and preferences. As the table below illustrates, the dominance of one prey species over another in a pike's diet is solely dependent on its availability. Therefore, if roach are the most numerous prey species, they will feature as the most targeted prey fish. Similarly if trout are the most numerous prey species, they will feature as the most targeted prey fish. Similarly if the bias towards trout as a prey item by stating that pike are mainly opportunistic feeders. As roach and perch numbers are typically higher than trout numbers by a significant multiple, then opportunities to consume these species will arise far more often, as illustrated by the following table.



Figure 7. Prey species persent relative abundance from catch data (apper) and pile diet stomach context data (bose). Contail diet properties fullow the general trends found in the environment. Exceptions occur in relation to species such as arbitrational that are generally under sampled due to their small star. Differences occur in Lough Scar In relation to theman and Roach a linear Hybrids, their related to differences in marphology line Discussion.

Excerpt from "The Diet of Pike in Irish Watercourses" - Pedreschi et al. (2014)

The report paid caution to current pike management policy and operations in light of this new research.

"Managers need data on feeding habits, interactions and competition in order to gain a better insight into community dynamics and manage waterways as ecosystems rather than separate components. This study for the first time provides this information across lake, river and canal habitats, representing a cross-section freshwater ecosystem diversity, and inputting directly into the better conservation and management of this economically and ecologically important species."

## 7.1.1 THE DIET OF PIKE IN IRISH WATERCOURSES CONTD.

There were two sampling methods used in this study. The first was stomach contents analysis of captured pike. This was a method also used in previous studies. However, as discussed previously, "stomach contents analysis" (SCA) gives only a snap-shot in time of what each pike has last consumed, and hence is not reliable in establishing the seasonal variation of what each pike consumes.

Stomach content analysis (SCR) is a useful tool that allows researchers to study sphares dets, enabling line scale species identification that often is not possible from other methods. However, SCR results provide only a snapshot of what has been ingested directly before sampting thus all prey types may not be obtained investigating stamach containts can be problematic in peakerous species, as it can be difficult to identify particuly digested remains, and pischarous species can often have employ stamachs which are uninformative



#### Excerpt from "The Diet of Pike in Irish Watercourses" - Pedreschi et al. (2014)

The second method employed in this study is known as "stable isotope analysis" (SIA). This method helps to provide a much more expansive and accurate representation of a pike's diet over its lifespan, and hence can go some way to formulating seasonal dietary variation. This study was the first time that SIA was employed in order to study the diet of Irish pike. No previous studies on the subject had used this method, with just SCA and the previously discussed inherent inaccuracies being used to inform and indeed shape pike management policy.



Excerpt from "The Diet of Pike in Irish Watercourses" - Pedreschi et al. (2014)

## 7.1.1 THE DIET OF PIKE IN IRISH WATERCOURSES CONTD.

There were a number of important findings and conclusions resulting from the report "**The Diet of Pike in Irish Watercourses**" - Pedreschi *et al.* (2014), many of which revealed to the reader severe deficiencies and inaccuracies in decades of previous research undertaken by IFI, CFB and IFT. Note that pre-2014 diet research continues to be used to shape pike management policy in Ireland. Some of the most notable findings with respect to the relationship between pike and trout are shown as follows:

#### **Diet and Trophic Variation**

As expected, pike do engage in piscivory, with roach and perch being by far the most important prey species across all sites, and within each site, with the exception of Lough Sheelin in 2011 and the River Deel in 2012, where trout and pike respectively, constituted the largest fish proportion of the diet. Contrary to the expected (Kennedy 1969; O'Grady & Delanty 2008), trout made up a small proportion of the overall diet, with predation levels being similar to pike cannibalism levels. This likely reflects the relatively low numbers of trout captured in the sites sampled.

It is generally acknowledged in the scientific literature that pike prey primarily upon fish once a length of >10cm has been attained (Frost 1954; Mittelback & Persson 1998; Beaudoin et al. 1999). In Ireland however, Healy (1956) stated that pike have a preference for fish when >55cm length, and noted that in two of the three lakes she examined, pike ate more trout than perch. This may have been due to the greater natural defences of perch (i.e. tough skin and hard spiny fin rays). More recently, O'Grady & Delanty (2008) have also highlighted the piscivorous habits of pike >60cm, which is further supported here, and described a preference of pike for eating trout in Lough Sheelin. As a 60cm fish in Ireland is estimated to be 5-6 years old (O'Grady and Delanty 2008), and as relatively few fish have been found to live beyond 6 years in Irish waters (Healy 1956; O'Grady & Delanty 2008), the impact of pike on brown trout may not be as drastic as previously feared, as it seems few individuals reach an age / size suitable for predating primarily on trout. The present study suggests that since the invasion of roach throughout Irish waterways, particularly since the 1970s (IFT Reports; King et al. 2011), a certain amount of predation pressure on trout in may have been alleviated. However, continued monitoring is essential for management purposes, as pike may predate more heavily on trout if roach stocks collapse, which can happen with the introduction of invasive mussels and clams.

Excerpt from "The Diet of Pike in Irish Watercourses" - Pedreschi et al. (2014)

#### Specialisation

The degree of dietary specialisation within a species will vary according to a range of factors such as abundance, size and behaviour of prey, along with preference and phenotype of the predator (Gurtin 1996). Within this study  $\delta$ 15N values often ranged across nearly a full trophic level within each population, indicating a that a wide prey base is used.

Specialisation and niche overlap values were low, further reflecting that individuals often ate different things from one another. Overall the data indicates a generalist population, and the marked opportunistic nature of individuals that appear to be utilising resources in proportion to their availability in the surrounding environment. The only site that did not present a strong correlation was Lough Scur, probably due to the high proportion of roach x bream hybrids present, which do not seem to be utilised as a food source by pike. This is likely due to the fact that roach x bream hybrids often have a deeper and more flattened body in comparison to roach (Nilsson & Brönmark 2000). Despite their predatory

capabilities, pike are generally cautious in the type of prey they pursue, usually selecting the least risky option rather than the most profitable prey (Hart & Hamrin 1988; Nilsson & Brönmark 1999, 2000). Handling time is very important to them as the risk of cannibalism can be high and as such pike tend to choose prey that are the easiest to manipulate and swallow, such as those with a more fusiform shape (e.g. roach instead of bream or hybrids) (Wahl & Stein 1988; Abrahams & Kattenfeld 1997; Robinson and Wilson 1998; Nilsson & Brönmark 1999).

Excerpt from "The Diet of Pike in Irish Watercourses" - Pedreschi et al. (2014)

#### Conclusions

An opportunistic feeding strategy is particularly advantageous in prey-limited temperate lakes (Chapman & Mackay 1990; Beaudoin et al. 1999; Domínguez & Pena 2000; Venturelli & Tonn 2005; 2006; Paradis et al. 2008). The present study has confirmed previous findings that pike are highly plastic in what they can utilise as a food source. This is important, as when conditions are limited in some way, they can ensure their survival through dietary flexibility (Frost 1954; Inskip 1982; Chapman et al. 1989). This flexibility is likely to have been a major factor in enabling them to adapt to a wide range of environments globally, and also enables them to adapt to perturbations through prey switching as certain species become more or less available throughout the year, or as species introductions occur (Frost 1954; Adams 1991; King et al. 2011); an extremely important attribute during these times of changing climate.

Overall it appears that, as a thoroughly efficient predator capable of dispatching any prey within its gape width, pike are inherently opportunistic, selecting only for more fusiform prey to minimise their own exposure risks when predating upon fish (Wahl & Stein 1988; Nilsson & Brönmark 1999; Domínguez & Pena 2000). This study has highlighted an unusual phenomenon in the delay of the ontogenetic dietary switch, widely reported to occur at lengths of 10-12cm (Frost 1954; Raat 1988 and references therein; Mittelback & Persson 1998). Within Ireland, stomach content data indicate that fish are more important in the diet from 40cm, and the primary food item after 60cm, however this is not clearly reflected in stable isotope values, instead a general increase in isotopic values is seen throughout life. It seems likely that as a consequence of the somewhat depaupaurate freshwater fish biodiversity, coupled with large numbers of invertebrate prey, Irish pike continue to prey on invertebrates (predominantly Asellus and Gammarus) throughout their

lifetime

This study has provided important baseline SIA information for this species in Ireland, and updated SCA data. Combined, these findings are particularly relevant in relation to the ongoing management activities, and the data from this study will contribute to policy management and plans. This research also serves to highlight the change in diet of a top predator with the introduction of an invasive species, in this case roach.

Research should continue to investigate stomach contents on a longer term sampling plan to see if they better reflect SIA values, and to build stronger estimates of individual specialisation and diet overlap. Sampling using a dedicated plan rather than opportunistic sampling would also facilitate a wider range of analyses and hypothesis testing, including for example, comparisons between seasonal variations in diet.

Managers need data on feeding habits, interactions and competition in order to gain a better insight into community dynamics and manage waterways as ecosystems rather than separate components. This study for the first time provides this information across lake, river and canal habitats, representing a cross-section freshwater ecosystem diversity, and inputting directly into the better conservation and management of this economically and ecologically important species.

Excerpt from "The Diet of Pike in Irish Watercourses" - Pedreschi et al. (2014)

## 7.1.2 INLAND FISHERIES IRELAND PIKE RESEARCH PROGRAMME 2016

It would be remiss of this document not to acknowledge the announcement by Inland Fisheries Ireland on 9th September 2016 that a new pike research programme has commenced.

IFI have stated that the research programme will "combine archived IFI data on pike ecology with empirical research on pike feeding and on the feasibility of transferring pike between Irish waters".

IFI also stated that a "cutting-edge mathematical model of pike-trout interactions" is to be developed. It has been stated that "this model will take account of existing knowledge relating to the focal species, including population dynamics, life-history strategies, feeding ecology, behaviour and physiology". It is suggested that the model "will be designed to simulate the populations of pike and trout in a lake specified by available input data and will be validated using available survey-based time series data from Irish lakes".

Furthermore, IFI state that "this research will be supported by additional field work looking at the seasonal variation in the diet of pike" and that "Genetics samples of pike will be taken from all waters where pike are recorded during routine IFI surveys on lakes and rivers (on-going), for future analysis".

Irish pike angling is clearly indebted to the work of Pedreschi *et.al.* (2013) and Pedreschi *et.al.* (2014b) for not only providing the only internationally peer-reviewed scientific research into the origins and dietary habits of Irish pike, but for providing a platform whereby scientific research into Irish pike will finally move into the 21<sup>st</sup> century.

Whilst it is recognised that IFI research now underway will potentially be very enlightening, it will nevertheless be necessary to cautiously welcome the research, particularly in consideration of conclusions drawn in section 6 in relation to past research. It is notable that "archived IFI data" will be used in the new research. This in itself raises justifiable questions and concerns. Further questions required of this research relate to the 'synergistic' effect on "pike-trout interactions", if one is to provide a reliable mathematical model that considers any fishery holistically, rather than concentrate specifically on just two "focal species".

In the interest of gaining a greater fundamental understanding of the research project currently being undertaken, the Irish Federation of Pike Angling Clubs presented a number of questions directly to IFI. These questions included the following:

- 1. How long will the project take from start to completion?
- 2. What are the terms of reference for the project?
- 3. Is there any independent input into the project methodology and analysis and if so, by whom?
- 4. How is the project being funded, and what is the estimated cost of the project?
- 5. Please provide advice on the "mathematical model" type that is proposed for this project.
- 6. Please provide a list of the specific "archived IFI data on pike ecology" which this project will be relying upon.
- 7. Please provide a list of the specific **"empirical research on pike feeding"** which this project will be relying upon.
- 8. Please explain what presumptions are considered by examining "the feasibility of transferring pike between Irish waters"
- 9. Please forward a precise list of all of the fisheries for which the **"seasonal variation in the diet of pike"** is being examined in this project.
- 10. On a fishery by fishery basis, please advise on the stomach examination methodology and capture process being used to assess the **"seasonal variation in the diet of pike"**.
- 11. In terms of **"genetics samples"**, please provide a precise list of the fisheries that this type of sampling applies to in this project.
- 12. On a fishery by fishery basis please explain the precise scientific analysis that will be applied to the **"genetic samples"** taken; e.g. stable isotope analysis; microsatellite markers, etc.
- 13. When do you expect to produce preliminary and final reports on the **"seasonal variation in the diet of pike"**?
- 14. When do you expect to produce preliminary and final reports on the "genetic sampling" results?
- 15. Can you please explain why the project is focusing on **"pike-trout interactions"**, solely rather than, for instance, the synergistic effects on trout populations within different fisheries?

As of November 2016, a response to the above questions is awaited from IFI; therefore it is not possible to discuss this research project further at this time.

## 7.1.3 SECTION SUMMARY CONCLUSION: CURRENT RESEARCH RELATED TO THE DIET OF IRISH PIKE

Pedreschi *et al.* (2014b) presents the most current research into the diet of Irish pike. Using a combination of SIA and SCA, it is without question the most scientifically superior analysis of pike diet undertaken since research began over 60 years ago, and has presented the diet of pike in a balanced and fair manner. However, research discussed in section 6 of this document continues to be used as justification for, and the formulation of, pike management policy in Ireland.

Current research has now shown that pike are opportunistic feeders, and will feed on prey that is most numerous and hence available to them. The previously-held idea that pike specifically target trout as a preferred food item is in effect questioned.

The location of numbers of large pike in pelagic and benthic zones across a variety of water environments highlights the preference of pike to feed on cyprinids and perch that shoal in vast numbers and are hence more available as a food item. Where pike are present and hunting in shallow water zones such as charophyte beds, the most available food source will be consumed.

Previous research assumes that trout will constitute the bulk of prey consumed by pike in these areas. However, as perch and cyprinids occupy these areas in far greater numbers from May to October, they become the most available food source. These conclusions are recent in the Irish context, but it is of particular concern that IFT, CFB and IFI did not recognise, and in effect ignored, such conclusions already drawn by Frost as far back as 1954.

Front (1934) and Lewler (1965) found that essent) changes in the diet of t.he DIAS AP peeced to be related to the availability of the fish food. Different species composition to Different species composition in store results in diverging othe different enters results in diverging other store. Lewier (1965) reports then the most Important food types nates in much of asystal pariods during the year in Roading Lake are: Hay and June - Eccol-perch (Parruphis unlacomaptus); July - spottail shiner (Netropsis Audeonius); August to September - yellow perch (Perca scens); October to March - sticklebacks (Perca flave-(Pun gitius gungitius and Euralis inconstans). In Windermary (Front, 1954), perch (Parca Huvis-LAMs) desur in the mine dist at all times, but predominate from May to Detober. Char (Salve-linus willughbii) are eaten only in November and December, brown trout (Salmo trutta greater extent from October to February. trutta) to Stick-Indexte (Gesterontuma scalaston) and alumnes (Phoxinas phasihum) are taken is spring and summer. Such measural variations are associated with the changes in habits of the food species.

Excerpt from "Synopsis of Biological Data on the Northern Pike:Esox Lucius" Food and Agricultural Organisation of the United Nations (1988)

Over the past two decades, there has been significant colonisation by cyprinids and vast increases in perch populations on a number of "designated wild brown trout fisheries". The data and evidence presented throughout a number of fishery survey reports (see Section 9.4) illustrates that such newly-established and/or increased populations of cyprinids and perch have a negative effect on brown trout. This effect is amplified as cyprinid and perch populations are subject to severely reduced predation upon them as a result of pike management operations.

One objective of the current research project being undertaken by IFI is to produce a "cutting-edge mathematical model of pike-trout interactions". If one considers that the population dynamics of all species within a fishery are inextricably linked to each other and to their environment, then one must consider that habitat loss, pollution, over-harvesting, climate change, arterial drainage schemes, over-grazing, bio-manipulation, etc., are critical contributors to the creation of a balanced and considered population model. At this time, further information is awaited.

IFI have expended resources, at a cost to the Irish tax payer, in undertaking research into pike diet leading to the findings of the resulting report **"The Diet of Pike in Irish Watercourses"** - Pedreschi *et al.* (2014). However, these findings have yet to be considered in the formulation of pike management policy, and hence the resources used in this study have yet to deliver any meaningful return to the Irish tax payer.

## 8 THE EFFECT ON PIKE DIET OF SPATIAL DISTRIBUTION OF FISH SPECIES

Inland Fisheries Ireland's theory of trout selectivity in the diet of pike appears to assume that all fish species are available in the ratio of their respective biomass to each pike equally at all times of a pike's natural migration through a fishery, and in particular during the pike spawning period in Spring, and as such, pike make a selective choice of food. However, Pedreschi *et al.* (2014b) found pike to be opportunistic feeders. Therefore, how does this finding apply to instances of trout found in pike stomachs?

Gargan & O'Grady (1992) studied the feeding relationships of trout, perch and roach in Lough Sheelin from 1982 to 1984. Perch were recorded feeding in charophyte areas in Spring 1982, but also underwent spawning migrations to shallow water, winter migrations, and were found to be feeding pelagically at times. King & Kirrane (1994) found that survey nets set on Lough Arrow in Spring 1994 caught perch in moderate/large numbers in deep water, with few perch in shallow water, and recorded that *"this type of spatial distribution represents the norm for a perch stock in an Irish lake at this time of year"*. Gargan & O'Grady (1992) suggested that roach in Lough Sheelin underwent a diel feeding migration but that they were much more restricted in their lake movements in Lough Sheelin. The spatial separation of the roach population was also suggested to reduce competition of roach for food, with both trout and perch.

The potential for seasonal spatial separation between pike and roach during Spring, and the apparent lack of roach found in pike stomachs during the Lough Sheelin Spring surveys 1978-2006 is not easily linked, nor is it discussed in the available scientific reports produced by Inland Fisheries Ireland. However, O'Grady (2006), in a review of Lough Sheelin fish stocks 2000-2006, stated that a reduction in the pike population at that time was of no surprise "given the fact that their major food source (roach) is no longer available". This comment suggests that pike must feed heavily on roach at some time during the year if a pike population is to be maintained; however, the clear evidence for this has not filtered into current scientific dietary reports. The inference here is that Inland Fisheries Ireland must be at least aware that seasonal influences on pike dietary habits take place, and that these influences detract from any presumed trout predation. It may be likely that such seasonal shifts in pike dietary habits may have some bearing on conclusions stemming from, for instance, the 118 tonnes; sometimes misquoted as 116 or 117 tonnes of trout suggested to have been eaten in Lough Corrib in 1995.

An interesting observation with regard to the 1983 Spring survey on Lough Sheelin is the number of pike stomachs containing perch. This is interesting if one looks at the tables in Sections 6.2.4.1 & 6.2.4.2. It can be seen that pike captured with perch in their stomachs exceeded those with trout by a ratio of 9:1. The ratio of perch to wild trout captured in the Spring survey during 1983 was approximately 1:1. It is recognised that the survey nets do not capture all sizes of fish. Furthermore, it is not intended that confidence is placed in the Spring surveys as representing the entire facts with regard to pike dietary habits. Nevertheless, this example is interesting in that Gargan & O'Grady (1992) commented on the close similarity in diet between trout and perch; therefore it could be argued that such heavy predation on perch, far in excess of their apparent availability in the stock, can only be of benefit to wild trout.

Craig (1996) commented that the *"consumption of prey by pike is not seasonally constant, but varies on a monthly or possibly on a more frequent basis due to predator opportunities, prey abundances and vulnerabilities and physical conditions".* 

The inference here is that the bio-manipulation of fish stocks in Irish fisheries, based upon a theory that pike select trout as a dietary item, may have more complicated factors at play and more consequences than Inland Fisheries Irelands research has shown to date.

### 9 PARAMETERS FOR SUCCESSFUL BROWN TROUT AND PIKE CO-EXISTENCE

The study of parameters for successful brown trout and pike co-existence was undertaken by Catherine L. Hein et. al. in 2013.

## 9.1 LAKE AREA

Lake area is defined as a parameter for successful co-existence and Hein's study revealed that these species could co-exist in large lakes where the lake area was greater than 4.5sqkm. All of the designated wild brown trout fisheries in Ireland, where pike management is currently practiced, are far in excess of 4.5spkm in area as the table below shows.

Fishery	Lake Area (sqkm)
Lough Arrow	12.47
Lough Carra	16.19
Lough Corrib	176
Lough Conn	57
Lough Cullin	10.2
Lough Mask	83
Lough Sheelin	19

## 9.2 LAKE TEMPERATURE

Lake temperature is defined as parameter for successful co-existence and Hein's study revealed that a pikes propensity to catch wild brown trout prey is minimal at water temperatures less than 10degC. The table below shows average seasonal lake temperature for a typical Irish lake with a surface area of 89 square kilometers. The table shows that for approximately 6 months of the year typical lake water temperature is below the parameter discovered in Hein's study. It must also be considered that from May to June, as temperatures increase above 10degC pike feed principally on cyprinids and perch in great numbers as these species are concentrated for annual spawning. Pike consume up to 50% of their annual food intake in this period. As lake temperatures continue to rise from July to September larger pike seek refuge from warm water and aestivate (remain dormant) until lake temperatures begin to fall again.

Depth [m]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.5*	-	5	5.5	9	13	14	16	17	17.5	10.5	-	-
6	-	5	5.5	9	13	14	15.5	17	17.5	10.5	-	-
12	-	5	5.3	9	13	14.5	15.5	17	17	10.2	-	-
18	-	5	5.3	9	13	14.5	15.5	16.5	17	10	-	-
25	-	5	5.5	8.7	11.5	14.5	15.5	16	17	10	-	-
27	-	-	-	-	11.2	14.5	-	-	-	10	-	-
30	-	-	-	8.5	-	-	-	-	-	-	-	-
* Surface.												-

9.3 EXISTENCE OF ALTERNATIVE SPECIES

Hein's study states that **"The total number of species in each lake was included to represent alternate prey species, which might dampen the interaction between brown trout and pike.".** Ecological changes in Irelands designated wild brown trout fisheries have seen the proliferation of perch and cyprinid species. The most recent studies of Irish pike diet (Pedreschi, 2014) have revealed that pike will prey upon the most abundant species present in a fishery, typically roach and perch.

#### **10 THE EFFECT OF PIKE MANAGEMENT POLICY ON WILD BROWN STOCKS**

The purpose of pike management operations previously executed by IFT, CFB and now IFI is to improve the wild brown trout stock on so-called "designated wild brown trout fisheries". The following sections will illustrate that pike management operations, amongst other factors, have resulted in the opposite effect.

#### **10.1 DAMAGE TO THE MIGRATORY SPAWNING STOCK**

As previously described in Section 6.2.3 (Timing of Sampling) trout spawn in many of the small rivers and feeder streams that flow into pike spawning bays. The migration of trout to their spawning rivers and streams usually occurs around November. When spawning is complete, trout migrate back to the lake and re-enter the shallow bays. According to IFI studies, the now spawned trout can stay in the vicinity for quite some time after spawning, before dispersing later back into the main body of the lake - O Grady *et al.* (2012).

Trout spawn in their natal rivers, and hence migrate to the same river year after year, often travelling great distances. The execution of pike management operations results in many mortalities with respect to both pike and trout. This is especially concerning, as the trout returning from their spawning rivers constitute the native migratory spawning stock of that river, and a reduction in their number vastly reduces the trout recruitment potential of their natal river year on year. The effect is further reinforced by the fact that the numbers of trout captured in and around their spawning rivers are decreasing, when in fact they should be increasing due to the removal of pike year on year illustrating that the basic objective of pike management operations does not work, and has a severely negative effect on trout migratory spawning stocks. This may be one of the contributory factors for the reduction in brown trout CPUE noted on a number of "designated wild brown trout fisheries" and described in detail in Section 9.4.

#### Dáil Éireann - Volume 319 - 15 April, 1980 Written Answers. - Lough Corrib (Galway) Fishing.

337. Mr. Holloy asked the Minister for Fisheries and Forestry the number of troot per year caught by the Inland Fisheries Trust on Lough Comb, County Galway, from 1960 to date.

Minister for Fisheries and Forestry (Mr. Power): The Inland Fisheries Trust remove predetors on trout from Lough Corro in order to improve the lake as a trout fishery. Some trout are unavoidably caught in the rem set for the predators. Trout that survive these operations are returned to the lake. The number taken by the trust each year since 1968, when records were first kept, is as follows:

[11535] <b>Year</b>	No. of trout released from nets and returned to lake	No. of trout found dead in nets
1968	1,905	1,130
1969	1,435	1,022
1970	1,224	943
1971	1,025	574
1972	959	552
1973	689	448
1974	775	\$34
1975	914	589
1976	924	724
1977	674	498
1978	573	358
1979	288	255
	1 1 T 1 T 1 T 1 T	

338. Mr. Holloy asked the Hinister for Fisheries and Forestry if the Inland Fisheries Trust have sprayed any of the waters of Lough Comb, County Galway with rotenone and, if so, why.

Excerpt from Dail records using IFT data showing a 78% decrease in captured trout over 11 years

## 10.2 INCREASE IN NUMBERS OF JUVENILE PIKE

A vast amount of international research has illustrated that removal of pike (an apex predator) from a fishery is an ineffective form of fishery management. In Ireland, removal of pike is undertaken in order to improve the conditions for survival of wild brown trout. The result of pike management operations as witnessed on the target fisheries and indicated by previous international research (**"Pike in Your Waters"** Broughton, Rickards, Fickling *et al.* (1992)) is that undesirable changes to fish population structures occur. As pike are cannibalistic, they regulate their own numbers. Removal of large numbers of older year classes means no regulation of juvenile pike. Juvenile pike feed as voraciously as any other fish species in their juvenile stage. However, at this time in their lifecycle their main food source is similar to other fish species, including trout, therefore increasing the competition for food between species. As juvenile pike reach a length of approximately 45cm, they become increasingly piscivorous. A proliferation of juvenile pike means a higher number of prey fish species are consumed at a juvenile stage. Studies have shown that pike management operations do not alter the actual pike biomass of a fishery. What they have shown is that numbers of pike increase greatly but specimens reduce in size.

The table below shows data gathered for Lough Corrib by the Inland Fisheries Trust (IFT) for the years 1961 and 1979. It is clear to see that due to pike management operations the pike population has more than doubled, while the total weight of pike or biomass was almost static. Incidentally, trout numbers decreased significantly, highlighting the ineffectiveness of pike management operations as a tool used to improve native wild brown trout stocks. The data clearly supports the substantial international science and research advising against pike management operations and detailing the adverse effects.

Gillnet Captures										
Year	No. of pike Captured	Weight of pike Captured (Tonnes)	No. of trout Captured							
1961*	5000	6	3035							
1979	13000	6.3	543							

\*trout data begins at 1968

For more than 50 years the longest and most comprehensive study of pike ecology and behaviour was conducted at Lake Windermere. Various regimes of intensive pike controls have been run and ceased over this period to monitor the effect this has on a fishery and validate related science and research. Below is an excerpt from Frost & Kipling relating to their extended research and aligning directly with modern fisheries science. It is worth noting how accurately these findings are continuously reflected in IFI fishery surveys and the cycle of predator removal following undesirable population explosions of juvenile pike and competitor species to wild brown trout.

After the initial perch population reduction, it was feared that the Windersterv pile would consome more trout and that this would be unpopular with sport fishermen. It was threefore pecided to reduce the pole population. After various trials and tens. first of flas, and now services, of 64 mm has were found to catch pike with a minimum of labour. and allow salesimids of up to 3 lbs (1.36 kg) to escape. Ucl nets of this mesh have been used each winter from October to February, from 1944 45 to the present, and they catch pile of about 55 cm and over. Because the females grow faster than the makes, the nets catule males of 4 years and older, and remains of Ayoury and older. From 1944 to 1979. 80 12.918 site weighing 32.7 timmes have been removed from Windermete. Each fish is measured, weighed, sexed and aged and the normach conserns analysed. After the writer all oilling to remove pike, nets continue to be set to tag pike V com 1949 10 1980 4559 pile have been tagged. A high proportion (up to 80% of some hatches) are recaught. The pike data have been worked up and published by Front (194e, 1954), Front & Kipling (1967), Kipling & Fimil (1970) and Le Cren et al. (1972). From the data the population numbers and biomass have been calculated. These are illustrated in Fig. 2. The points to note in this figure see. 13 after an initial reduction the number of plan w Windermere has only fallen below the pro-mitting level in 1958; 2) the biomass has only exceeded the par-netting level in one year, 1962. This suggests that the netting has led to Windermere containing more but smaller pike. This is also shown in Table. It in the later years there are relatively more. younger pike in the catches than in the first year of gill notting. Table 2 indicates that the pike are growing faster, although the differences are not large.

Excerpt from "Synopsis of Biological Data on the Northern Pike: Esox Lucius" Food and Agricultural Organisation of the United Nations (1988)

## 10.3 REDUCED PREDATION ON SPECIES COMPETING WITH WILD BROWN TROUT

As previously described, fisheries where pike management operations are executed experience reduced numbers of both adult pike and trout. Pike and trout are both predators, and so play an important role in maintaining and controlling other fish populations as well as their own. While adult pike are the primary regulator of numbers of juvenile pike, trout will also readily predate on pike, and contribute to controlling the numbers of juvenile pike present. Both pike and trout will predate on species such as roach and perch (O'Grady et al. 2001); however, the effect of this predation is significantly reduced where pike management operations are executed.

Other fish populations (roach, perch, hybrids, bream) can thrive in the absence of predation by adult pike and trout. Spiralling roach and perch populations are recognised by many as one of the biggest threats to wild brown trout populations, as these species compete directly with trout for the same food sources throughout or at certain periods of their life-cycle (O'Grady et al. 2001). In addition, perch can also predate directly on trout. Roach and perch populations can increase dramatically in the absence of a suitably balanced and naturally-controlled predator stock.

The effect of an increased perch and cyprinid population (due to lack of predation as a result of pike management operations) on the food web shared by these species and brown trout is clearly referenced in the 2012 Lough Corrib survey report. The 2012 report states:

"The recovery in the perch population in 2012, compared to 1996, in addition to the increase in roach x bream hybrid and bream numbers and the maintenance of a moderate roach and trout stocks in 2012 means that the standing crop or biomass of fishes feeding on plankton and macro-invertebrates was substantially higher in 2012 compared to 1996."

The fecundity (rate of reproduction) of trout, perch and roach illustrates how quickly trout can be outnumbered by other species. Lack of predation on these species by both trout and pike is compounded, as large numbers of trout and pike are removed during pike management operations.

Species	Fecundity (eggs/kg of body weight)
Trout	900
Perch	45000
Roach	25000 - 1,000,000

## 10.3.1 ADDITIONAL LOADINGS ON THE FOOD WEB OF TROUT DUE TO PIKE MANAGEMENT OPERATIONS

The following data is shown in order to illustrate the extra loading placed on the food web supporting a trout population in a "designated wild brown trout fishery" where pike management operations are undertaken. In this case, Lough Corrib is used as an example. Prior to assessing this estimate, there are some important points to consider that have been discussed previously in Section 6.2.2.3, the contents of which are shown below for reference.

#### 6.2.2.3-07-GRADY-ET-AL\_(1996)-1

2° binds et al. (1996) internated that the usuals Contin who possible in 1995 electric ate sym. 253,000 -Houtmentricip contributions. This isan's was used to support a broader funding application in part of the "Indexion Angling Measure" (TAM), attractione, particle which was to include the removal of pile from Usugle Contin. §"

The estimated calculation of trout eaten relied upon a number of assumptions, including the following: 4

- > that the population of pike in Lough Comb in 1995 was calculable by applying an estimate for the pike acquisitiver on Jacob Strating Instant-one CPUE's and fake uniform area, and random this astimate to the CPUE's and Man-tailary pre-officially instants.
- + that the detail provinte up Comb during 1990, sid-solution get a size of the
- > that the biomass of trout to reach-(i.e. 80% --20%) found in pike-stomachs in the 1996-Lough Corrib stocksurvey, was constant for the entire year, 1995.4
- The calculation of the pixe population on Lough Corrib for the year 3995 in the manner performed above, without using support the mark receptore techniques to samply that a an Jation contribution to fair a question allot foundation for the with rested 318 frage of stock water in 1995.

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Trust (2754) and tamine (2784) issued componential charged in the line of the Bills or of provide in the extend in the steel solution of the first task. Extended to the steel solution of the provide charge issues to descent a solution of the provide charge of the steel of the solution of the initial charge of the solution of the sourced provide solution of the solution of the sourced of the solution of the solution of the sourced of the solution of the level of solution of the solution of the level of the level operation of the solution of the solution of the level of the level operation of the solution of the solution of the level of the level operation of the solution of the solution of the level of the level operation of the solution of the solution of the level of the level operation of the solution of the solution of the level of the level operation of the solution of the solution of the level of the level operation of the solution of the solution of the level of the level operation of the solution of the solution of the level of the level operation of the solution of the solution of the level of the level operation of the solution of the solution of the level of the level operation of the solution of the level of the level of the leve

Energy Anna "Synopein of Biology of Coresponds Hardware History (Cores)" Apoll and Agriculture (Corporation of Co the United Hardware (2000)

This information would have been available to the Central-Fisheries-Board-in 1996.4

1

Finally, it should be noted that 461 pike were captured during the spring stock survey on Lough Corribin 1996. Of the 461 pike captured, 45 pike (a. Mil) were reached as certaining (rout (FG/104/01/C) - the the many hypothesis that Awat into the obtained as also terminate of public for struct waters constant a section reached to file domain as "other on the section of the terminate of public termination of (CI/104/01/C). The the many is the termination of the section of the section of the termination of (CI/104/01/C) - the termination of the termination of the section of the terminate of the termination of the termination of the termination of the section of the termination of termination of termination of the termination of t

The data and calculations in the following table are the "best minimum estimate" that could be calculated in the absence of mathematical methodology and data from IFI. While potentially incorrect (due to lack of information from IFI), the data and calculations highlight the significant additional loading and level of competition for food when numbers of both predatory pike and trout are eliminated from a fishery through pike management operations.

# 10.3.1 ADDITIONAL LOADINGS ON THE FOOD WEB OF TROUT DUE TO PIKE MANAGEMENT OPERATIONS CONTD.

Total Trout Stock (kgs)	Avg Size (kgs)
232000	1

	Cumulative Total of Pike Removed over 9 Years									
	Year	Consumption Ratio	Captured (kg)	Total Consumption Adult (kg)	Total Consumption Juvenile (kg)					
Adult (Gillnets)	2004	4	2104	8417						
Juvenile (Electro)	2004	7	426		2981					
Adult (Gillnets)	2005	4	2104	8417						
Juvenile (Electro)	2003	7	426		2981					
Adult (Gillnets)	2006	4	1620	6481						
Juvenile (Electro)	2000	7	323		2264					
Adult (Gillnets)	2007	4	1849	7395						
Juvenile (Electro)	2007	7	230		1607					
Adult (Gillnets)	2009	4	1753	7012						
Juvenile (Electro)	2008	7	285		1995					
Adult (Gillnets)	2000	4	2026	8104						
Juvenile (Electro)	2009	7	137		959					
Adult (Gillnets)	2010	4	1731	6924						
Juvenile (Electro)	2010	7	364		2548					
Adult (Gillnets)	2011	4	1904	7616						
Juvenile (Electro)	2011	7	152		1064					
Adult (Gillnets)	2012	4	1103	4412						
Juvenile (Electro)	2012	7	241		1687					
		Total after 9 years		64778	18086					
Trout (contribu	ition to rem	noved pike stock diet, 16	5% adult, 10% juvenile)	10364	1809					

Note: Data unavailable for year 2004 hence 2005 data replicated

Additional Loading on trout food web by roach and perch due to pike removal									
Roach (23% and 7%)(kg)	14899	1266							
Perch (24% and 21%)(kg)	Perch (24% and 21%)(kg) 15547								
Т	otal(kg)	35510							

## 10.3.2 AN EXAMPLE OF DIETARY CROSSOVER BETWEEN PERCH AND WILD BROWN TROUT

Studies undertaken by Dr. P Gargan on Lough Sheelin between 1983 and 1984 highlighted the level of dietary cross over between roach, perch and wild brown trout.

More recently the fishery survey "National Research Survey Programme, Fish Stock Survey of Lough Mask, F. Kelly et. al. 2015" illustrates clearly the level of dietary crossover between the species and the potential impacts of uncontrolled cyprinid and perch populations due to the removal of pike from the fishery.



Diet of perch captured on Lough Mask, June 2015 (% occurrence) n=55



Diet of brown trout captured on Lough Mask, June 2015 (% occurrence) n=19

## 10.4 REDUCTION IN NUMBERS OF WILD BROWN TROUT ON DESIGNATED WILD BROWN TROUT FISHERIES

The following sections will illustrate how wild brown trout stocks have diminished on designated brown trout fisheries due to various issues, and with particular reference to pike management operations. Additional factors such as pollution, habitat destruction, and poaching will also be discussed where relevant. Species density is measured by calculating the Catch Per Unit Effort (CPUE). CPUE is a widely used method for establishing species density in a fishery, and is calculated by dividing the total number of individuals captured for a particular species by the total number of nets set during a fishery survey.

Accurate data generated through intensive fishery surveys (undertaken by IFT, CFB and IFI) will be used in the following sections. Such data is available for Loughs Corrib, Carra, Conn, Cullin and Sheelin.

Data generated through less intensive fishery surveys for the purposes of the Water Framework Directive will be shown and referenced only where applicable. Such data is available for Loughs Arrow, Mask and Owel. The conclusions and trends for these fisheries are similar to those drawn for the fisheries with more detailed and extensive data sets.

## 10.4.1 LOUGH CORRIB

There have been two intensive fishery surveys conducted on Lough Corrib. The CPUE (Catch Per Unit Effort) values of both surveys are shown in the following table.

	Year	Trout	Pike	Perch	Roach	Bream	Rudd	Hybrid	Tench	Salmon	Eel
	2012	1.54	0.94	2.8	5.75	0.13	0	2.52	N/A	0.02	N/A
Lough Corrib	1996	1.95	1.84	0.08	4.96	0	0.02	0.25	N/A	0.02	N/A

While the comparisons between the two surveys must take into account slight variations in survey methodology, the 2012 Lough Corrib report attempted to fill in such gaps by back-calculating the 1996 CPUE values in order to bring them into line with the 2012 survey methodology.

This data set is particularly relevant in highlighting the effect of pike management operations on a fishery, as the 1996 survey was conducted at the end of a 10+ year moratorium on pike management operations. In 1997 pike management operations resumed on Lough Corrib.

A first look at the 2012 Lough Corrib report shows that 16 years of intensive pike management operations have had no beneficial effect on the overall wild brown trout population. The CPUE value for pike has decreased significantly by 48.9%. The CPUE value for brown trout has decreased by over 21%. The objective of pike management operations is to reduce predation by pike on trout and hence observe an increase in the trout stock; however, in the case of Lough Corrib trout population density has effectively reduced by almost a quarter since 1996 - even with an almost halving of pike population density in the same period.

The reduced number of pike due to pike management operations has, over the 16-year period, led to a large increase in the numbers of perch, roach and hybrids. As previously described in Section 9.3, these species compete directly with brown trout for food, and, in the case of perch, predate heavily on trout fry and smaller trout as well as their food sources.

The CPUE values for perch increased by 3,400%, roach increased by 15.9%, and hybrids increased by 908%. The increases for perch and hybrids are particularly significant. The 2012 report states:

"The 1996 survey data suggests that at that time roach dominated upper L. Corrib followed by trout, while numbers of pike and then roach were greater in the lower lake. The 2012 survey data follows a different trend with roach along with perch and roach x bream hybrids completely dominating the upper lake. Lower Corrib showed signs that the levels of trout, pike, roach and even perch were similar." A significant observation relating to perch numbers pre-1986 is made within the survey report. It is interesting to note that pike management operations were active prior to 1986, and perch stocks were reported to be very high at this time possibly due to the reduced number of pike and trout. When pike management operations ceased after 1986, perch numbers dropped considerably as recorded in the 1996 survey; disease was cited as a factor at this time. The resumption of pike management operations in 1997, and recovery from disease, has resulted in a 3400% increase in perch numbers, due in part to severely reduced predation by pike. Perch predate heavily on juvenile trout and compete directly for the same food sources. The 2012 report states:

"A major recovery in perch stocks has taken place with the catch increasing from 21 individuals in the 1996 survey to 699 fish in 2012. Prior to 1986 L. Corrib was known to have large stocks of perch."

Some of the summary findings discussed in the 2012 Lough Corrib report correlate with subjects already discussed in this document.

For example, the 2012 report states:

"Most trout migrating to the lake appear to stay in the areas near the outfall of their natal river in springtime"

This would correlate with the errors in data related to pike diet due to the timing of pike stomach sampling analysis discussed in Section 6.2.3. This also correlates with the risks to the migratory spawning stock of particular trout spawning streams where pike management operations are undertaken, as discussed in Section 9.3.

Significant environmental impacts have occurred on some of the important trout nursery streams. In particular, very poor trout recruitment from the Cross and Black rivers has had a significant impact.

If an improvement in brown trout angling on Lough Corrib is to be realized, a more holistic approach must be taken in assessment of the relationship between trout densities, other fish species, eutrophication, stream habitat degradation, and cropping of trout by anglers. The data and issues discussed have illustrated that trout stocks do not benefit from pike management operations, which have the potential to be highly counterproductive in protecting a balanced and healthy environment in which brown trout can thrive.

Prior to the establishment of the IFT in 1951, and hence any form of state-coordinated predator management on Lough Corrib, the lake boasted the finest trout and pike fishing in Europe. Since the initiation of predator management by IFT, the quality of trout and pike angling has suffered, with the exception of periods of moratorium as recorded between 1986 and 1996. One of the concluding remarks made by Dr. Martin O Grady in the 1996 Lough Corrib report states:

"The size and stock structure of the trout population, as measured in the 1996 survey, represents the ideal in fishery management terms - substantial numbers of young adult fish (< 40cm) many of whom will be large enough to be cropped by anglers in the 1996 and 1997 angling seasons. The numbers of older larger fish (>40cms) will ensure a good spawning population in the following year. The angling catches in both 1996 and 1997 were considered to be good."

## 10.4.1.1 NOTE ON IMPROVEMENT IN BROWN TROUT POPULATION DENSITY FOR LOWER LOUGH CORRIB OBSERVED IN THE LOUGH CORRIB 2012 SURVEY REPORT

The 2012 Lough Corrib survey report noted an improvement in the CPUE value of brown trout stocks in an area defined as the lower lake. The improvement has been heralded as a success of pike management operations; however, there are some additional factors to consider here.

The area defined as Lower Lough Corrib is shown in the following diagram as Area 5. It is clear that the area defined as the lower lake is quite small in comparison to the lake as a whole. For example, Areas 2 and 3 alone could accommodate three to four times the surface area of Lower Lough Corrib. In this context, the area where improvement has been noted is small when considering the lake as a whole. As previously noted (Section 9.4.1), the overall CPUE value for brown trout on Lough Corrib has decreased by 21%.

It is also important to consider the proximity of Lower Lough Corrib to two of the most important trout spawning streams for the entire catchment. The Abbert and Grange rivers both flow into the Clare river, which empties into the lower section of Lower Lough Corrib. The Abbert and Grange rivers account for 44% of the total trout recruitment for the entire lake. Trout that originate from these catchments predominantly stay in the lower lake, due to the richness of the aquatic environment there. The numbers of trout in the lower lake are further supplemented by trout from the other major contributory catchments, namely the Bealnabrack, Cornamona and Oughterard rivers, as these trout migrate south due to the lack of productive aquatic conditions in the vicinity of their natal catchments to produce trout (in particular the Abbert and Grange rivers) will have a positive effect on the trout population of Lower Lough Corrib.



Figure 2.3. L. Corrib sampling zones (1 to 5) and HI lake stores/offices.



Figure 4 a. The distribution of trout of Abbert origin in the 2012 lake survey sample.



Figure 4 b. The distribution of trout of Grange origin in the 2012 lake survey sample.

Excerpt from "A Survey of Adult Fish Stocks in Lough Corrib" - O'Grady et al. (2012)

## 10.4.1.2 NOTE ON LOUGH CORRIB PIKE DIET

During the Lough Corrib 2012 survey pike stomach contents were examined in order to establish dietary patterns. Section 7 of this document illustrates the inherent flaws and inaccuracies that can occur by solely using SCA (Stomach Contents Analysis) as a method to establish dietary patterns. However, the data gathered will be discussed briefly here. The following pie chart shows the dietary patterns of pike in Lough Corrib.



Figure 3.17. The dietary patterns for young (0+ - 3yrs), young adult (4 - 7yrs) and older adult pike in the 2012 Corrib survey.

Excerpt from "A Survey of Adult Fish Stocks in Lough Corrib" – O'Grady et al. (2012)

Section 6.1 of this document refers to the misconception throughout IFI Fishery Surveys and pike studies that pike do not hunt pelagically or in benthic zones. This is incorrectly referenced in the Lough Corrib survey report. Pike will readily feed in shallow weedy areas, but the assumption that trout will be the most numerous and hence available food item is incorrect as both perch and cyprinids will occupy these areas in higher numbers at certain times throughout the year (see Section 8: The Effect on Pike Diet of Spatial Distribution of Fish Species). The 2012 report states:

"The bias of the larger pike in preferentially selecting trout as a dietary item is probably a reflection of the distribution of the different prey fishes and the hunting practices of pike - most trout  $\geq$  30cm will be feeding in shallow weedy areas, the pikes preferred hunting area. In contrast many roach and perch may be feeding either pelagically or in benthic areas with a muddy/sandy bed, zones which are not the favoured hunting areas of pike."

## 10.4.1.3 INFORMATION DEFICIT FOR LOUGH CORRIB DIETARY ANALYSIS

Of immense importance is that scientific studies and the results presented to the public are founded upon fact and that they are balanced. The slide below presented to the pike policy review group in 2011 continues to be an influential aid to the anti-pike lobby, as well as damaging to the pike itself, as it portrays an unsubstantiated dietary impact of pike upon the trout stock in Lough Corrib (see section 6.2.2.3). The slide is discussed further below, as is the failure to create an appropriate balance in what is a contentious issue that regrettably has allowed disagreement to fester between pike and trout anglers in Ireland over many years, and which Inland Fisheries Ireland have allowed to continue.



Excerpt from "The Necessity for Controlling Pike Stocks in Some Quality Irish Wild Brown Trout Managed Lake Fisheries" A presentation to the Pike Policy Group, November 2011

Section 6.2.2.3 refers to the estimation of O'Grady *et al.* (1996) that the Lough Corrib pike population in 1995 alone ate over 255,000 trout weighing over 118 tonnes, (not 116 tonnes). As discussed, this estimate was calculated using a biomass theory, hypothesising that the ratio of total trout weight taken from the stomachs of 43 of 461 pike captured, compared to total roach weight, could be applied to the entire year 1995.

O'Grady *et al.* (1996) in 'Section 6' of their report, made a number of management recommendations with regard to Lough Corrib. Some of the recommendations were administrative in nature, in respect of the "Tourism Angling Measure 1994-99" (TAM), under which pike removal was to receive EU funding in response to the respective 1996 report. More importantly, some of the recommendations laudably sought to scientifically research a number of the assumptions (See Section 6.2.2.3) made in O'Grady et al. (1996), which led to the estimation of 118 tonnes of trout eaten.

A Freedom of Information request (i.e. FOI/103/07/W – See below) was made by the Irish Federation of Pike Angling Clubs in 2007. The request sought all relevant records referenced in 'Section 6' of O'Grady *et al.* (1996). The records would include pike stock density reports over a five-year recommended period, a stock survey recommended for 1999 considered necessary to review the effectiveness of the strategy, and, most importantly, a dietary analysis of pike for Summer and Autumn in order to assess, presumably, the validity of assuming that trout made up 80% of the diet of pike in 1995 in the calculation of 118 tonnes.

## EXTRACT FROM REQUEST - FOI/103/07/W

With regard to the report produced by the Central Fisheries Board under the EU funded 'Tourism Angling Measure 1994-1999', titled:

'Fish Stock Survey Report for Loughs Corrib, Mask and Carra and Future Management Options for this Fishery Resource' of 3<sup>rd</sup> July 1996.

and in the interest of understanding the review and conclusions reached on completion of the 'Western Lakes Project' as explicitly recommended under Section 6 within the report and also in the interest of understanding the scientific basis for the current stock management policy on Loughs Corrib, Mask and Carra following completion of the TAM project, the following information is requested:

- With regard to '6.1 Recommendations (key elements)', please provide a copy of the pike stock density reports for Loughs Corrib, Mask and Carra for each of the intervals for the stated five year period.
- With regard to '6.5 Recommendations (key elements)', please provide a copy of the "Fish stock survey exercise and results undertaken in "1999 on Loughs Corrib and Mask as part of a review of the effectiveness of the management strategy".
- With regard to '6.7 Recommendations (key elements)', please provide a copy of the dietery analysis of pike sampled in mid-summer and autumn.
- Please provide a copy of the status report regarding the 'Western Lakes Project' sent to the EU 'Tourism Angling Measure' funders on completion of the 1994-1999 monitoring and development program.
- Please provide a copy of all stock analysis and respective reports for all species, undertaken on Loughs Corrib and Mask, since the completion of the 'Western Lakes Project' in 1999 to the present date.

## EXTRACT FROM RESPONSE - FOI/103/07/W

The FOLAct 1997 & 2003 provides for making such records exempt under its exemption provisions. In this case, and in relation to the records you request, the exemption under Section 10 – Refusal on administrative grounds to grant requests under Section 7.

"Section 10 - Refusal on administrative grounds to grant requests under Section 7.

10.(1) A head to whom a request under section 7 is made may refuse to grant the request if

(a) The record concerned does not exist or cannot be found after all reasonable steps to ascertain its whereabouts have been taken."

The response to the Freedom of Information request (i.e. FOI/103/07/W) is significant, as it proves that the scientific research recommended by O'Grady *et al.* (1996) was not undertaken. Furthermore, the authors of O' Grady *et al.* (1996) were the chief scientific staff with Inland Fisheries Ireland (then Central Fisheries Board) at that time, and presumably would have been aware of any impediments, financial or otherwise, that would have prevented the execution of the necessary corroborating scientific research on Lough Corrib.

The scientific research deficit that currently exists with regard to Lough Corrib, notwithstanding some unscientifically conducted pike stomach sampling from time to time, allows the continued uncorroborated or internationally peer-reviewed use of the statement that "An uncontrolled pike stock in Corrib needs a maintenance ration of 116 tonnes of trout!".

The inference here is that the current scientific research is simply incomplete, uninformative, and is not based upon robust scientific validation.

## 10.4.2 LOUGHS CONN & CULLIN

There have been a number of intensive fishery surveys conducted on Lough Conn since 1978. The CPUE (Catch Per Unit Effort) values of these surveys are shown in the following table.

	Year	Trout	Pike	Perch	Roach	Bream	Rudd	Hybrid	Tench	Salmon	Eel
	2005	2.1	1.7	12.1	64.1	N/A	3.3	N/A	N/A	N/A	N/A
	2001	2.5	2.1	23.9	24.4	N/A	16.33	N/A	N/A	0.17	N/A
	1998	1.15	0.7	9.48	0	N/A	0.4	N/A	N/A	0.1	N/A
	1994	4.3	1.8	15.67	0	N/A	0.08	N/A	N/A	0.2	N/A
	1990	6.4	1.18	17.88	0	N/A	0	N/A	N/A	0.2	N/A
	1984	6.84	0.35	3.89	0	N/A	0	N/A	N/A	N/A	N/A
Lough Conn	1978	5.56	0.21	N/A	0	N/A	0	N/A	N/A	N/A	N/A

	Year	Trout	Pike	Perch	Roach	Bream	Rudd	Hybrid	Tench	Salmon	Eel
	2001	1.5	2.9	13.7	91.2	N/A	23.8	N/A	N/A	N/A	N/A
	1998	0.9	1.5	9.1	0.2	N/A	31.4	N/A	N/A	N/A	N/A
Lough Cullin	1994	11.9	5	6.9	0	N/A	4.6	N/A	N/A	N/A	N/A

Loughs Conn and Cullin, like Lough Corrib, have undergone intensive periods of pike management operations over a number of decades. Despite the execution of these operations, the data illustrates a steady decline in trout densities on Lough Conn, with short periods of minor improvement as a result of other factors.

The trend for Lough Conn is similar to other designated wild brown trout fisheries in Ireland. As densities of competitor species (perch/ cyprinids) rise exponentially, trout densities lower. Eutrophication plays a part in reducing the suitability of the lake for high numbers of trout, while cyprinids can thrive in such environments.

The reduced numbers of pike due to pike management operations has been a major contributory factor to a large increase in the numbers of perch, roach and rudd. As previously described in Section 9.3, these species compete directly with brown trout for food, and in the case of perch predate heavily on trout fry and smaller trout. The 2001 survey report (O'Grady, 2001) states:

## "There may be competition for food between cyprinids and trout either at the zooplankton and/or macroinvertebrate levels."

A thriving cyprinid population can also have a significant indirect effect on the trout angling on the lake by altering the behaviour of the trout population thus compounding the conclusion that there is no longer quality trout angling available. The 2001 report (O'Grady, 2001) states:

"The presence of large numbers of young cyprinids will provide a food supply for trout  $\geq$  30 cms in length all year round. Should a significant proportion of the trout population become largely piscivorous then they will be less available (harder to catch) using traditional fly fishing methods. This trend is already evident – 12.2% of the large trout captured in the 2001 L. Conn and Cullin surveys had been feeding on cyprinid fry."

A significant observation relating to pike numbers can be seen in the Lough Conn data, as it is typical of trends recorded in other "designated wild brown trout fisheries". As the densities of perch and cyprinids increase, the pike density also increases, despite the significant drop in trout density. This correlates with the subjects discussed in Section 7, and clearly shows that pike will not specifically target trout, even in the presence of larger numbers of other species.

Significant environmental impacts have occurred on some of the important trout nursery streams of Loughs Conn and Cullin. An extensive sub-catchment enhancement programme was undertaken from 1996 to 1998, which greatly improved the numbers of trout within these rivers and is responsible for the improvement in trout densities in 2001.

"Over the period 1996 to 1998 very extensive fishery enhancement programmes were carried out on all of L. Conn's sub-catchments. A monitoring of the effectiveness of these programmes has shown that the capacity of these rivers and streams to produce trout were significantly increased by these exercises – i.e. recruitment of young trout to the L. Conn population has greatly increased from 1998 to date (2001)."

However, the environmental problems facing the lake itself negated the full potential of these improvements. Predation by pike was not cited as a reason for the decline in trout density due to the "effectiveness" of pike management operations; however, the many negative effects due to such operations were not mentioned in the report.

"One can conclude therefore that the numerical decline in trout numbers in Lough Conn in 2001 is due to a failure of young trout, despite their increasing numbers in L. Conns sub-catchments, to survive in the lake itself. Similarly the increased growth rate of trout can be linked to changes in the lake."

The fish stock survey data indicates that the N.W.R.F.B. pike management programme has been and, still is (2001), successful. The paucity of trout in the lake cannot therefore, in this instance, be linked to increased predation rates by pike.

Young trout in Irish loughs tend to be largely pelagic for at least a year after migrating to the lough feeding principally on zooplankton. It seems most likely therefore that the cultural eutrophication problems in L. Conn have depressed the production of key food items required by young trout thereby limiting their survival."

If an improvement in brown trout angling on Loughs Conn and Cullin is to be realized, a more holistic approach must be taken in assessment of the relationship between trout densities, other fish species, eutrophication, stream habitat degradation, and cropping of trout by anglers. The data and issues discussed have illustrated that trout stocks do not benefit from pike management operations, which have the potential to be highly counterproductive in protecting a balanced and healthy environment in which brown trout can thrive.

## 10.4.3 LOUGH CARRA: AN EXAMPLE IN IMPROVING BROWN TROUT STOCKS BY ADDRESSING THE REAL ISSUES

There have been a number of intensive fishery surveys conducted on Lough Carra since 1978. The CPUE (Catch Per Unit Effort) values of these surveys are shown in the following table.

	Year	Trout	Pike	Perch	Roach	Bream	Rudd	Hybrid	Tench	Salmon	Eel
	2009	4.4	0.8	1.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2001	6.1	0.7	0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1996	4.4	0.8	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1986	2.1	0.9	0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1981	3.6	0.1	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1980	2.7	0.1	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1979	1.9	0.2	0.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lough Carra	1978	0.8	0.1	0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lough Carra is a good example of how brown trout stocks can be improved by addressing the significant and more important issues facing a "designated wild brown trout fishery". Such issues include eutrophication, nursery stream habitat destruction and intensive cropping by anglers.

The data illustrates two periods of stable pike densities on Lough Carra between 1978 to 1981 and again from 1986 to 2009. Perch densities, unlike previously discussed fisheries, have remained low and hence have had no significant impact on trout density.

From 1978 to 1981, there was a steady increase in trout density on the lake. The 1986 survey records a significant drop in trout density due to sub-catchment degradation through an arterial drainage scheme. Most "designated wild brown trout fisheries" have at some point been affected by sub-catchment degradation. It is interesting to note that the Western Regional Fishery Board cite this as a reason for trout density decline, but also mention the effect of a higher pike density in the lake on the trout stock. However, from 1986 to 1996 trout density increased to higher levels than any period pre-1986, even though pike densities remained stable at the higher 1986 levels, which would not correlate with findings in the report. The survey report states:

"Lough Carra's stream sub-catchments were subject to an arterial drainage scheme carried out over the period 1981-1985. This probably accounts at least in part, for the decline in the standing crop of trout in the 1986 survey. The decline in numbers at this point in time (1986) may have also been due in part to a decline in controlling pike stocks – pike netting efforts were reduced by 50% from 1985 onwards and ceased completely in 1988. A pike control program was reintroduced in 1992 at a "pre-1985" intensity and has continued to date (O'Grady et al. 1996)."

Again, in the period from 1996 to 2001 trout density increased significantly. This increase was not due to increased levels of pike management, as pike density remained stable. Two factors were responsible for this increase: the first was an extensive sub-catchment restoration programme conducted between 1998 and 2001. The survey report states:

"From 1998 to 2001 a major post-drainage stream enhancement program was carried out on all of the sub catchments to the lake of the Western Regional Fisheries Board."

The second major factor that contributed to the significant increase in trout density between 1996 and 2001 was a vast increase in the amount of trout being caught and released by trout anglers. The table below illustrates clearly the effect on trout numbers, during periods of both low and high catch and release rates. Post-2003, the numbers of trout killed by trout anglers returned to "normal" levels, and contributed to the drop in CPUE value from 6.1 to 4.4 between 2001 and 2009. This data is further validated by assessment of the numbers of trout caught in gill-nets over the same period during annual pike management operations.



## Total number of trout caught and the proportion killed

Excerpt from "Lough Carra Angling Records" - Chris Huxley (2011)



Excerpt from "Lough Carra Angling Records" - Chris Huxley (2011)

The Lough Carra data clearly illustrates how an erroneous emphasis on pike management operations results in the partial masking of much more significant factors that affect brown trout densities in "designated wild brown trout fisheries". Two major factors when addressed resulted in vast improvement in trout density between 1996 and 2009 even though pike densities were higher than in any other period.

It is interesting to note than in the summary conclusions of the 2009 Lough Carra Survey report the Western Regional Fisheries Board vindicated itself and its management strategy of Lough Carra as a result of the excellent brown trout densities that were recorded. It can be assumed that a large part of the self-vindicated management strategy related to pike management operations. Little emphasis was awarded to the two major factors (subcatchment enhancement and extensive catch and release of brown trout) that contributed to the rise in trout densities, nor the significance of their overall effect on a fishery compared to the lesser effect of a stable native pike population.

"The large trout stock and limited pike densities recorded in Lough Carra in both the 2001 and the 2009 surveys vindicates the Western Regional Fisheries Boards (WRFB) management strategy in relation to this resource. The successful maintenance of Lough Carra, into the future, as a quality wild brown trout fishery necessitates a continuation of the WRFB's current management strategy."

## 10.4.4 LOUGH ENNELL: AN EXAMPLE IN IMPROVING BROWN TROUT STOCKS BY ADDRESSING THE REAL ISSUES

Lough Ennell displays a similar trend to Lough Carra following the remediation of ecological factors affecting the lake and restoration of salmonid spawning habitat. It should be noted that pike management operations have not been conducted on Lough Ennell since 1990 and this has not limited the fisheries capacity to produce an abundant trout population. In fact, by addressing the negative environmental and ecological factors affecting the lake and its sub catchments and closure of the Lough Ennell Trout Hatchery, the fishery has reached its maximum potential to produce wild brown trout without the necessity for any form of pike management or control.

"the current largely "undisturbed" pike population, particularly in Lough Ennell, did not prohibit a significant increase in the adult wild trout population in this lake following the Shannon Regional Fisheries Boards successful stream enhancement programme in this fishery. Lake survey C.P.U.E. values for wild trout in Lough Ennell surveys from 2002 and 2006 ranged from 3.4 to 4.0 (Figure 8). The highest wild trout C.P.U.E. value ever recorded in a midland trout lake was 5.0 in Lough Sheelin in 1978 (Figure 6). Given that Lough Ennell has a significantly smaller euphotic zone than Lough Sheelin it is likely that a C.P.U.E. value for wild trout in Lough Ennell of 4.0 reflects this waters optimum trout carrying capacity." O Grady/ Delanty, 2008.

Note: The comment by O Grady 2008 in relation to Lough Sheelin is incorrect. IPS/ IFPAC have established that the trout density or CPUE for Lough Sheelin included both wild and farmed/ stocked trout therefore incorrectly elevating the trout CPUE value for Lough Sheelin. The correct maximum value for Lough Sheelin is approximately 3.68 therefore Lough Ennell, a fishery where pike management is not practised, holds the highest trout population density value for any midland lake and is substantially higher than Loughs Corrib, Mask, Conn and Cullin.

## 10.4.5 LOCH LEVEN: AN EXAMPLE IN IMPROVING BROWN TROUT STOCKS BY ADDRESSING THE REAL ISSUES

The most famous of all wild brown trout fisheries, Loch Leven in Scotland, has had a very similar history to many of Irelands wild brown trout fisheries. Responsibility for managing the fishery is with Loch Leven Fisheries who describe the Lochs history.

"Nowadays, catch records are not comparable as the majority of trout are caught & released but recent seasons have seen a discernible recovery in catches following several decades of decline. The factors behind that decline most probably relate to the deterioration in water quality that accompanied amongst other things increased population within the catchment area and more intensive agricultural practices. Measures introduced since Scum Saturday (13th June 1992) when a blue-green algal bloom created national headlines, have seen water quality improve dramatically as levels of phosphates / nitrates going into the loch have fallen over 60% from pre 1992 levels.

In former centuries, Loch Leven was about four miles long and three miles wide. But in December 1830 a drainage scheme was completed that dropped the water level of the loch by up to nine feet and reduced its area by almost a quarter. The scheme also involved cutting a new channel for the outflowing River Leven and creating sluices to control the flow of water from the loch.

The appearance of the loch before the drainage can be gauged by the visitor at the old churchyard of Kinross. Originally the water lapped at the foot of the churchyard wall. On Castle Island, when Mary, Queen of Scots was imprisoned there in the 1560s, the loch reached the battlements. Today the loch reveals seven islands, but prior to the drainage there were but four: St Serf's, Castle, the Reed Bower and Roy's Folly. Most of the loch is now very shallow, with the exceptions of two 6o-foot holes to the east of Scart Island and around the western and southern sides of St Serfs. Before 1830, the large area known as "The Shallows" was more than twice its present depth. This massive alteration has had major effects on the fish populations of Loch Leven. Salmon, and possibly sea trout, ran the old River Leven: they are gone. So too is the charr which, presumably, could not tolerate the shallower water. The pike too also almost became extinct here, but not because of the drainage: it was exterminated to protect the trout stocks (in 1903 14,000 pike were removed by netting). However recent seasons have also shown signs that the pike population could be on the rise again, so too the perch, both of which is encouraging as it confirms the loch is returning to rude health."

Similar to Loughs Carra and Ennell the remediation of negative environmental factors has seen the Lochs trout population recover to a very high level. Additionally pike and pike angling is actively promoted.

Loch Leven Fisheries (2014). "What the survey suggests is that, last autumn, they found just under 900 fish per hectare which measured 40mm or more in size. Although these will predominantly be brown trout, it will also include pike & perch as the hydroacoustic equipment does not differentiate between species. CEH quite reasonably tells us not to place undue weight on the absolute numbers (ie 900 fish per hectare) but they are pretty confident about the trend which suggests the fish population has doubled since 2011 and quadrupled since 2009"

197	Home	Fistore	Fishing Reports	Pylices
Loca Leven Fisienes				
Pike Fishing				

In conjunction with the improving water quality, recent years have seen a significant recovery in the pike population to the extent that pike anglers are now fishing the loch again and catching spectmens up to 26 lbs.

The majority of Loch Leven is shallow and weedy, this environment has presented no difficulty for pike and trout to co-exist and based on recent evidence the trout population has expanded without pike management operations in place.
# 10.4.6 SECTION SUMMARY CONCLUSION: THE EFFECT OF PIKE MANAGEMENT POLICY ON WILD BROWN STOCKS

The philosophy behind pike management operations on "designated wild brown trout fisheries" is that removal of an apex predator (pike) from the fishery should reduce predation by pike on brown trout and hence improve the trout angling potential of the fishery. However, as detailed in Section 9.4, the execution of pike management operations over extended periods of time has not had the desired effect and has in fact been one of many contributory factors in the decline of brown trout stocks on such fisheries. Pike management operations take the focus of anglers off the real issues affecting brown trout stocks, and presents stakeholders with the easiest opportunity to show that something is being done to conserve the species. Issues that are far more difficult to combat and control but have a far more significant impact on brown trout stocks are given less focus. For Inland Fisheries Ireland, the management of pike populations is in effect far easier to execute and manage as opposed to dealing with stream degradation and enhancement, habitat restoration, eutrophication, drainage schemes, flood relief schemes and many other high-impact issues affecting brown trout populations and recruitment.

Arterial drainage schemes have decimated sub-catchments of many brown trout fisheries. Outside of the Shannon and Lee hydroelectric schemes, the Corrib-Clare arterial drainage scheme conducted through the 1950s and 60s is cited as having the most significant ecological impact on Ireland's natural river heritage. The scheme decimated the trout and salmon recruitment potential of this catchment, which includes the Abbert and Grange rivers, which currently account for 44% of trout recruitment to Lough Corrib. However, there remains an expectation that trout angling on Lough Corrib should be as it was pre-1950, and that the issue is primarily pike and not destruction of trout nursery streams. Works have been undertaken over a number of years that have led to parts of the catchment being restored, but significant current and future challenges remain, such as widening the Clare river to facilitate the Claregalway flood relief scheme. Schemes such as this undertaken in the past have had a far more significant impact on brown trout stocks than an unmanaged and naturally-balanced pike stock could ever have, as was the case prior to 1951.

Intensive cropping of trout by anglers, and in particular during catch and kill trout competitions, has a severely detrimental effect on trout populations. The case for catch and release and the resulting higher trout densities is clearly illustrated in Section 9.4.3 in the Lough Carra data. This is validated by the numbers of trout caught in gillnets during pike management operations, as can be seen in the table below showing higher numbers of trout during the period of high catch and release rates from 1998 to 2003.

Compounding the apparent poor angling returns for brown trout are the changing feeding habits of trout on some "designated wild brown trout fisheries". The appearance of invasive species such as zebra mussels and roach have contributed to changing feeding habits of brown trout, thus making them less available to anglers, a trend reflected in the Lough Conn data.

The main issues negatively affecting brown trout populations have been discussed in this section. Over six decades of pike management operations have resulted in poorer brown trout densities, a fact highlighted by trout densities and catch returns during periods of moratorium on predator management. In the light of this information and the weight of awareness and knowledge of far more impactful issues previously discussed, pike management operations continue on "designated wild brown trout fisheries".

## 11 THE DESTRUCTION OF SALMONID SPAWNING HABITAT ON LOUGH CORRIB'S CROSS RIVER

The Cross and Black rivers were once two of the primary trout spawning rivers for the north-eastern part of Lough Corrib. As detailed in section 9.4.1, the contribution to the Lough Corrib trout population of both these rivers has vastly reduced, "*The poor contribution of the Cross and Black rivers (a combined figure of 8%) may be responsible for the decline in trout numbers in the north-eastern part of the lake noted since the 1996 survey*" O'Grady (2012).

The eastern side of Lough Corrib comprises mainly agricultural land, which is used predominantly to farm cattle. It could be assumed that nutrient enrichment and poor water quality would be responsible for the degradation of fish and invertebrate populations on the river; however, the river exhibits excellent water quality characteristics. Excessive macrophyte growth along the river, particularly towards the mouth, would suggest that there are input influences from nitrates and phosphates at work.

Macroinvertebrate samples show that despite the clarity and cleanliness of the water many expected macroinvertebrate groups are not present, namely *Tricoptera*, *Ephemeroptera* and *Plecoptera* spp. Specimens from each group occur at sites closer to the lake outflow; however, locations in the upper river are all but devoid of specimens.

The upper Cross River, where one would expect to find spawning trout at the appropriate times, has been subjected to heavy modification to a point where it is canalised for a lot of sections. The straightening and extensive dredging that occurred on this waterway to aid with agricultural land drainage has so dramatically altered the habitat that the expected macroinvertebrate communities have been damaged. A lot of pool, riffle and glide habitats have been removed from the upper river, resulting in a substrate that can only support a limited range of said invertebrates.

The habitat that some of these invertebrates need to survive is exactly the same as the habitat trout need for spawning. Extensive removal of gravel from the river through the dredging for drainage has ensured that there are not sufficient spawning beds for adequate trout recruitment; hence the north-east Corrib trout declines. Trout can only spawn where there is suitable habitat for them to spawn.

Noting the data and examples shown in section 9.4, it can be assumed that the modification of numbers of subcatchments surrounding "designated wild brown trout fisheries" has led to the same situation as that of the Cross river and hence has been of the highest significance with respect to declining trout populations.

## **12** SECTION 59: THE LEGISLATION RELATED TO PIKE MANAGEMENT OPERATIONS

The legislative mechanism that allows Inland Fisheries Ireland to remove fish from a watercourse is Section 59 of The Inland Fisheries Act 2010. In relation to "designated wild brown trout fisheries" Section 59 is used with respect to pike management operation undertaken by IFI and also to grant what are termed "Section 59 Exemptions". Section 59 Exemptions are granted to mainly trout angling clubs and bodies in order for them to execute pike culls without being in breach of pike bye-law number 809 (2006) which is designed to protect pike over 50cm in length and limit the taking of pike to one individual under 50cm per day. Such culls commonly take the form of angling competitions outside of the normal trout angling season. Culls that take place inside the trout angling season are commonly called "mixed grills" as essentially anything that is caught is killed in. Such competitions/ culls are commonly known as catch and kill events, and through issuance of Section 59 exemptions are essentially endorsed by Inland Fisheries Ireland.

The first statement in Section 59 legislation states **"(1) Subject to this section, for the purpose of improving any fishery (whether or not the fishery is the property of IFI) IFI may do all or any of the following, namely-"**. This statement raises particular concerns, as actions undertaken using Section 59 legislation have the primary objective of improving the target fishery. Section 9 of this document has clearly shown that decades of pike management operations undertaken within the bounds of Section 59 (and its predecessors) have not realised an improvement in trout stocks on "designated wild brown trout fisheries".

## Inland Fisheries Act 2010



#### Excerpt from "The Irish Statute Book"

 $\gamma_{\rm b}$ 

## **13 THE COST OF PIKE MANAGEMENT OPERATIONS**

## 13.1 COST OF OPERATIONS

Using available data\*obtained using the Freedom of Information Act, the cost of pike management operations averages €146,560 per year. The number of pike removed average at 9958 specimens per year.

The objective of pike management operations undertaken using Section 59 on "designated wild brown trout fisheries" is to protect the trout population and improve trout angling returns. Changes in the trout population of these fisheries are measured using CPUE (Catch per unit effort), which is calculated using data from fishery surveys. As shown in Section 9, the CPUE values for trout on "designated wild brown trout fisheries" have been in decline for some time despite continued pike management operations.

Pike management operations are undertaken annually, hence the associated operational costs are incurred annually, in addition to lost tourism angling revenues. Fishery surveys are not undertaken annually (e.g. Lough Corrib, 16 years between surveys), hence there is no way to establish whether the execution of and expenditure on pike management operations have delivered their stated objective. This results in the Irish tax payer funding pike management operations for extended periods of time without transparency or visibility of whether their investment has delivered its intended return.

Currently there is no valid cost benefit analysis to justify pike management operations carried out by Inland Fisheries Ireland.

Recent fishery surveys undertaken by Inland Fisheries Ireland on "designated wild brown trout fisheries" have in general shown declining trout populations, as shown in Section 9.

				W	db .			New	db (	\$24	fb
		Lough	Corrib	Lough	Mask	Lough	Carts	Lough Co	an/Cullin	Lough 5	heelin
		Electro		Electro		Electro		Electro		Electro	
		Exhing	Gillowth	fishing	Gillmets	fishing	Gillowta	flatting	Gillmete	flatting	Gillineta
2005	No. Pike	5,377	1,438	1,789	1,536	$\sim$		100	1,119	200	0
	Total Weight Ib	939	4,639	759	6,128		$\sim$	434	4,918	800	0
	Total Cost €	6,466.00	17,219.00	10,098.00	26,053.00	X	X	482.00	33,804.00	27,800-00	0.00
	Cost per Pike	1.03	11.97	5.64	19.50		$\langle \cdot \rangle$	2.92	30.00	139-00	0.00
	Contrib 6	5.81	3.71	13.30	4.25	$\langle \$	$\sim$	1.11	4.87	34.75	0.00
2006	No. Pike	7,752	2,182	948	1,219		$\sim 2$	0	625	310	0
	Total Weight Ib	713	3,572	600	3,567			0	2,349	1,085	0
	Total Cost C	10,364.00	30,445.00	6,009,00	22,176.00	X	X	0.00	7,386.00	34,000-00	0.00
	Cost per Pike	1.34	13.95	0.34	18.19	$\sim$		0.00	94.08	109.67	0.00
	Cost/lb-f	14.54	8.52	8.63	6.22	$\langle \rangle$		6.06	3.16	31.34	0.00
2007	No. Pike	1,234	2,243	1,768	963	417	390	11	1,113	0	575
	Total Vieight Ib	506	4,076	1,409	4,814	284	1,039	40	6,217	0	2,700
	Total Cost 6	15,732.00	48,966.00	12,142.00	20,175.00	2,099-00	7,290,00	96:00	22,482.00	12,008-00	44,800.00
	Cost per Pike	12.75	21.63	0.67	21.17	5.00	18.54	8.72	20.20	12,000-00	66.37
	Cost/b-6	31,09	12.01	8.32	4.18	7.39	6.96	2:09	3.36	9.00	16.59
2008	No. Pixe	624	2,269	1,347	775	189	697	25	1,503	Ċ.	2,400
	Total Weight Io	625	3,864	1,923	4,515	723	1,803	264	12,129	0	9,600
	Total Cost 4	0.501.53	24,891.00	13,067.87	21,968.70	1,535.90	11,438.33	1,307.00	29,370.00	0.00	46,800.00
	Cost per Pixe	10.35	10.97	9.70	28.49	6.14	16.41	37.34	15.55	0.00	19.50
	Costib 4	15.27	6.44	4.80	4.87	6.90	6.34	4,95	1.93	9.99	4.86
2009	No. Pile	180	1434	1443	832	$\langle \rangle$	$\langle \rangle$	177	9133	0	9403
	Total Weight to	163.24	4010.78	803.75	2067.25			637	6159	0	4015
	Total Cost 4	4042.67	23796-01	10457.66	25508.25	X		5472	25272	0.00	67200
	Cost per Pike	22.46	16.71	7.25	30.78	$\langle \rangle$		30.91	22.3	0.00	47.9
	Cost/Ib f	24.77	5.52	10.67	6.42			0.59	4.1	0.00	16.73

### ANNUAL PIKE REMOVAL COSTS 2005-2009 (Five Select Fasherier).

Note: (Wrfb - Western Regional Fisheries Board); (Nerfb - North Western Regional Fisheries Board); (Shrfb - Shannon Regional Fisheries Board)

Total Combined Electrofishing and glineting Cost for 2005 = €129,912 ----- (11.334 pike removed @ (€10.68 per pike) gr (€8.49 per lb) Total Combined Electrofishing and glineting Cost for 2005 = €199,279 ----- (12,936 pike removed @ (€8.53 per pike) gr (€8.34 per lb) Total Combined Electrofishing and glineting Cost for 2007 = €186,722 ----- (10,035 pike removed @ (€2.1.10 per pike) gr (€8.39 per lb) Total Combined Electrofishing and glineting Cost for 2007 = €186,722 ------ (10,135 pike removed @ (€2.1.51 per pike) gr (€8.49 per lb) Total Combined Electrofishing and glineting Cost for 2009 = €181,843 ----- (10,135 pike removed @ (€2.55 per pike) gr (€8.49 per lb) Total Combined Electrofishing and glineting Cost for 2009 = €181,843 ----- (10,592 pike removed @ (€2.55 per pike) gr (€8.09 per lb) Total Combined Electrofishing and glineting Cost for 2009 = €181,843 ----- (10,592 pike removed @ (€2.55 per pike) gr (€8.09 per lb) Total Combined Electrofishing and glineting Cost for 2009 = €181,843 ------ (10,592 pike removed @ (€2.55 per pike) gr (€8.09 per lb) ----- (Correct to 31st July)

Note: During years 2005 to 2009 Indusive - 48.791 Pike were removed at a Cost of 4732.801or €14.71 per Pike from the specific flaharies tabled. (By gillnets alone 25.625 Pike were removed at a Cost of €551,076.29 or €21.50 per Pike removed - Average weight of gillneted Pike was 3b 11oz)

Note: Pike weights and numbers for Loughs Mask/Carra for 2005, 2006 and 2009 are combined under Lough Mask heading

\*More current data has been requested under the Freedom of Information Act for years 2010 to present.

## 13.2 ECONOMIC IMPACT TO THE IRISH TAX PAYER

The negative economic impacts of pike management operations are wide and varied, but generally affect areas where alternative opportunities for revenue and employment are limited, such as rural towns and communities. Such areas have typically not felt the effect of the general recovery in the Irish economy in recent years. Pike management operations further limit employment and revenue opportunities in these areas outside of the main tourist season, as thousands of domestic and international pike anglers stay away in protest and on the assumption that their target guarry is very limited.

	P	ike Seaso	'n						Pike S	eason	
					Trout Se	ason					
				N	lain Tou	rist Seaso	n				
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

As opposed to some other fish species, pike do not require management in order to function in a fishery and reach an acceptable size and number to attract anglers. It is true that pike populations fare best when neglected. However, IFI are investing year on year on management that has no beneficial effect to pike or any other species, and in fact vastly reduces the attractiveness of Ireland's pike-angling product. Pike management policy endorses the widelyheld idea that Ireland's fishery management policies are in fact anti-pike.

Angling as a whole contributes €836,000,000 to the Irish economy and supports over 11,000 jobs directly. There is a contribution from pike angling of 12.2% or €102,000,000. In terms of placement pike angling is the fourth largest contributor to overall angling revenues with brown trout third, sea angling second and salmon and sea trout angling the largest contributor. However, as detailed in the IFI commissioned report **"The Economic Contribution of Pike Angling in Ireland 2015"** pike angling is vastly underrepresented with significant potential for growth through a more focused management approach for the benefit of pike. In this independent report there is recognition that currently the potential of pike angling revenue is severely limited due to negative pike management policy. IFI states in its own market research (2015) in the National Strategy for Angling Development that: *"current pike management policies may impact negatively on Ireland's reputation as a prime pike angling destination"*, and additionally, the potential for pike as an asset for angling tourism with a status as *"the number one sport fish in Germany, France, the Netherlands and Italy"* and that pike fishing is *"also quite popular amongst anglers in the UK"*. A positive change in management policy would see pike angling revenue contribution increase greatly as large numbers of anglers return and hence elevate its contributory position. This is supported by data from both domestic and international anglers alike.

### 14.1 IFI CONTRAVENTION OF ECONOMIC AND NATIONAL ANGLING RELATED POLICY

Through review of the various policies and intent of Inland Fisheries Ireland, it is apparent that the organisation's actions on the ground do not align. In relation to Fisheries Protection, the public message conveyed by IFI through various media is *"Inland Fisheries Ireland is charged with ensuring the protection and conservation of our fisheries resource, both the fish and their habitats. IFI's area of responsibility covers both inland waterways and out to the twelve mile limit off the coast. The species protected include all freshwater fish, sea bass and certain molluscs." Inland Fisheries Ireland kills and disposes of more freshwater fish than any other individual or organisation in Ireland.* 

In 2013, at a cost of €110,000 to the Irish tax payer, IFI commissioned the **"Socio-Economic Survey of Recreational Anglers"**. The report recognised the value of all angling disciplines to the Irish economy, and highlighted recommendations and changes. In the same period, the **"Inland Fisheries Ireland Pike Policy"** document was being reviewed by IFI and various stakeholders through a review committee structure. Mid-way through this process, IFI decided to stand down the Pike Policy Review committee. The **"Inland Fisheries Ireland Pike Policy"** was released in 2014, and did not integrate recommendations made within the Socio-Economic study or the Pike Policy review committee. IFI have stated publicly that their pike Policy was endorsed by the pike angling stakeholder on the review committee, when in fact this is not the case. Further concessions on pike policy were agreed with the pike angling stakeholder earlier in the review process, but not honored by IFI.

The **"National Strategy for Angling Development"** (NSAD) is the first comprehensive national framework for the development of Ireland's angling resource. The development of this strategy has come at a cost to the Irish tax payer, and its implementation will cost €25,000,000 over a 5-year period. IFI's current pike management operations would appear to be odds with the NSAD on many fronts.

A key strategic objective of the NSAD is to enhance Ireland's international reputation as a key destination in the angling world. Current Pike Management Policy and Operations are a major obstacle to this and are recognised as such across the NSAD main target markets of the UK and mainland Europe. Continued implementation of current pike management policy supports the widely-held opinion that some Irish fishery management policies are archaic, outdated, and at odds with modern research and international best practice, and hence provide no benefit for the target fishery.

## 14.1 IFI CONTRAVENTION OF POLICY CONTD.

A key action measure in the NSAD is to "Encourage stakeholder engagement and involvement in fisheries development and management". Using the recent Pike Policy review as an example, it is unclear as to how this will be successfully implemented by IFI when stakeholder input is not valued, considered or implemented.

Implementation of the NSAD is proposed to occur in a structured step-by-step approach. The continued practice of Pike Management Operations would appear to directly oppose the intent at the very beginning of this process.

**Delivering the National Strategy for Angling Development** Step 1 - 2010 Inland Fisherles Iteland is established and produced Corporate Strategy Key Collectives: To develop the potential of the inland funereal NSAD sector by increasing the number of resident and found angles. empowining dateholders and generating a better retain for In Europianite itelana. Step Step 2 - 2013 Socio-Economic Study of Recreational Pero-Pero

Angling in Ireland is published

Excerpt from "The National Strategy for Angling Development" (2015)

## 14.2 IFI CONTRAVENTION OF PIKE MANAGEMENT POLICY & SOP'S

With respect to Pike Management Policy IFI purport to operate within guidelines and standard Operating Procedures. The two most relevant SOPs are **"Inland Fisheries Ireland Standard Operating Procedure (SOP) for Pike Management Operations using Gill-nets"** and **"Inland Fisheries Ireland Standard Operating Procedure (SOP) for Pike Management Operations using Electrofishing Apparatus"**. It has been a long-standing opinion that the SOPs (past and present) have rarely been adhered to. Much evidence from anglers and the general public supports this, and in recent years many IFI staff have been photographed and filmed executing Pike Management Procedures in an improper and barbaric way. The recent IFI review of both SOPs was initiated by damning evidence filmed in March 2015 on Lough Conn and released on social media one year later by a member of the public.

## https://www.youtube.com/watch?v=QLLoUmk4CnE https://www.youtube.com/watch?v=qEzcIXuUnAM

Correct execution of pike management SOPs were intended to facilitate the return of pike over a certain length to their waters, with smaller individuals removed and disposed of. In some cases, pike over a certain length were to be transferred to other "more suitable" waters. Simple measuring devices are mainly absent on management vessels, raising questions as to how a determination is made on length. The video evidence released on social media suggests that loop holes in the IFI SOPs were being used whereby pike that should have been returned were indeed retained in the bottom of boats or barrels with insufficient water for hours at a time. When staff attempted to return the pike, they were already dead, but as an attempt has been made to return them there was no contravention of the SOP - hence no repercussions for IFI or its staff.

The recently updated SOPs do not garner much support. They remain open to contravention by staff, as determinations of fish to be returned are entirely subjective and at the discretion of the senior officer. IFI face many challenges here, as typically senior staff endorsing and undertaking pike management operations are informing field staff with erroneous data on the pike's role within the target fishery. This is a major obstacle to overcome if proper implementation of SOPs is to occur; field staff are unfairly left open to criticism and intense scrutiny by members of the public as they execute ill-informed policies endorsed at more senior levels in IFI.

Irrespective of whether the current SOPs can be followed or not, they have no place in modern fishery management, and by consigning them to the past IFI could solve many public relations issues and reclaim much support from the angling public and their peers internationally.

## 15 THE PRACTICE OF GILL-NETTING, ELECTROFISHING AND PIKE MANAGEMENT OPERATIONS

## 15.1 GILLNETTING

Gill-netting involves the use of fine nets to trap and entangle fish and eventually cause death. With respect to the use of gill-netting for IFI pike management operations, the main target species is pike; hence the gill-nets are placed in shallow bays from February to May each year in order to capture egg-laden females and spawn-bound males en route to spawn in reed beds and shallow margins. The method is entirely indiscriminate by nature. Many species of fish are caught in gill-nets and recent evidence suggests that high numbers of brown trout perish in addition to pike, perch, roach, bream and salmon. As gill-nets are typically laid in areas that are "food rich" for water birds and mammals, much additional wildlife risks becoming entangled and dying. Species include ducks, grebes, herons, swans, water hens, otters, mink, and indeed any living creature that potentially comes into contact with the gill-net.

Gill-nets are also a concern for Public Health and Safety, as typically they are poorly marked and cannot be easily seen in the water. Gill-nets have the capacity to entangle swimmers and various other water users with dire consequences. Boat users are also at serious risk, as engines can easily become entangled and hence disabled, therefore stranding the occupants or in bad weather conditions potentially causing a boat to capsize.

## 15.2 ELECTROFISHING

Electrofishing involves the use of electric current passed through the water column between two electrically conductive rod; fish or animals in the area are stunned as they pass through the electric field. Whilst some fish do survive this process, it is quite often fatal for larger specimens such as pike. Scientific evidence suggests that significant spinal damage occurs in longer fish species such as pike and trout when affected by electrofishing resulting in a high mortality rate later. To avoid this, specific specialised training is required in order to set up the electrical equipment correctly for conditions at the start of the operation and for the duration of the operation.

## **15.3 INTERNATIONAL BEST PRACTICE**

Inland Fisheries Ireland purports to implement pike management operations to the same standards as international best practice. Internationally, the use of gill-netting and electrofishing as methods of species control are deemed necessary, and in most cases only permitted, where the target species is non-native - pike are native to Ireland.

Internationally Loch Leven in Scotland is known as the best wild brown trout fishery in the world, a reputation it has held for over a century. Pike are present in Loch Leven with pike angling promoted at the fishery which now also boasts world class pike and perch fishing. Pike are not managed or culled by Loch Leven Fisheries.

## 15.4 RETURNING PIKE CAPTURED DURING PIKE MANAGEMENT OPERATIONS

IFI pike management policy calls for the return of pike exceeding a certain length. Evidence suggests that this does not presently occur and has not in the past occurred, in the intended way. Using available data and taking Lough Corrib as an example, the tables shown below illustrate that an average return rate of just 0.39% is executed during pike management operations.

No. of pike Captured								
Year	Electrofishing	Gillnets	Total					
2008	924	2269	3193					
2009	180	1424	1604					
2010	1583	1773	3356					
2011	918	786	1704					
2012	942	2087	3029					

Pike captured annually averaged over 5 years 2577	2577
---	------

	No. of pike Returne	ed	
Year	Electrofishing	Gillnets	Total
2008	0	10	10
2009	0	20	20
2010	0	8	8
2011	0	9	9
2012	0	3	3
Pike returned	annually averaged over 5 years		10

The data shown shows that an average of just 10 pike per year are returned to Lough Corrib during pike management operations. Considering the data set as a whole, between 2008 and 2012 12,886 pike were captured and just 50 returned. Pike that are returned are allegedly Floy-tagged by IFI.

## 15.3 RETURNING PIKE CAPTURED DURING PIKE MANAGEMENT OPERATIONS CONTD.

On waters where return rates are purported to be higher, such as Lough Mask, a worrying statistic emerges. For more than a decade, it has been recognised that the quality of pike fishing on Lough Mask has collapsed. However, it remains practised by a few local dedicated individuals who do not have to travel long distances or invest in overnight accommodation for resulting poor returns. Allegedly IFI Floy-tag captured specimens that are then released back into Lough Mask. With such vastly reduced and hence localised pike populations, it is reasonable to assume that some of these pike would be recaptured by legitimate means (rod and line) or at a minimum recaptured in subsequent stock surveys or pike management operations. However, there have been no recaptures of Floy-tagged specimens recorded since the tagging regime began on both Loughs Mask and Corrib. This raises many concerns such as:

- 1) Are pike over a certain length returned at all (as required by IFI SOPs) and if so are they actually tagged?
- 2) Are pike that are captured tagged and released, but soon after perish due to injuries caused by gill-nets and/or electrofishing?

Studies of pike and pike movement referenced in the **"Synopsis of Biological Data on the Northern Pike (1988)"** show a considerable rate of recapture of tagged pike for years after initial tagging.

Gill nelling	or relocated			
2010	12			
2011	54	1		
2012	18			
2013	16*			
2014	28			
. Mask - 20 Jate	10 Gill nettin	g (ri = 12) Weight	Floy Tag No.	Receiving Waters
Date.	Lagette	Ukraliske	Elmi Tar No.	Bacabiles Waters
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				100.00
27/01/2010	- 14	n/a	2700	Misa
27/01/2010	96	n/a 0/a	2700	Mase:
27/01/2010 28/01/2010 28/01/2010	96 UZE	n/a n/a -n/a	2700 -2699 -2698	Masa Masa Mesi
27/01/2010 28/01/2010 29/01/2010 05/02/2010	96 101 104	n/a 0/a n/a 0/a	2700 2698 2698 4649	Misk Misk Misk
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Number of Lough Mask pike returned or relocated for year 2010

## **16 SUMMARY**

It is clear that pike management operations have a wide range of negative effects on both the angling community and the general public as a whole. The negative economic impact on rural communities will continue until policy changes and a more sustainable and balanced strategy is employed.

Pike management policy is divisive among the various angling groups and disciplines within Ireland. Such conflict is highly counterproductive and undesirable at a time when anglers and state agencies need to work together harmoniously to protect our fisheries and habitats against threat. Poaching, illegal fishing, pollution, habitat restoration, and climate change are just a few of the many challenges facing our fisheries. Anglers as a group are one of the most important guardians of the natural environment; they are the eyes and ears of our waterways, and can only afford them maximum protection when unified.

Evidence supports the view that pike management policy has not had its intended effect on fisheries. This is indicated by a reduction in stocks of wild brown trout, whilst pike populations are severely reduced. This raises the question as to what research has been undertaken to ascertain the root cause of the decline of this important and valuable species in fisheries where pike management is executed annually. More likely causes are degradation of trout spawning habitat in important feeder streams and increases in populations of competitor species (roach, perch) due to decreased predation. Degradation of trout spawning habitat has been a major problem nationally, and there is an ongoing battle against such factors as pollution, encroachment and enrichment. IFI execute habitat restoration and stream enhancement projects in many areas of the country. Local angling clubs contribute significantly in this area also, by funding and executing such works themselves on their local waters. IFI would generate much good-will and support by abandoning pike management operations and the wasteful utilisation of resources to execute it while redirecting those resources to tackle the real problems facing important wild brown trout populations.

The continuation of pike management operations results in the destruction of one of Ireland's natural resources at significant expense to the Irish economy.

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## Addendum to Economic and Ecological Effects of Pike Management Operations Conducted by Inland Fisheries Ireland and Deficiencies in its Justification

Document

P160301/030/002



## **1 REVISION HISTORY**

Revision History							
Revision	Author	Notes					
1.0		First Issue					

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## 2 INTRODUCTION

This document defines additions and changes to document P160301/030/001 - Economic and Ecological Effects of Pike Management Operations Conducted by Inland Fisheries Ireland and Deficiencies in its Justification Revision 1.0.

## 2.1 LIST OF CHANGES

- 1) Addition of new Section 4.1.1.3 Full Text of Barbe, F & Garrett, S (2000) Research.
- 2) Edit of Section 4.1.2 Section Summary Conclusion: Past Research Relating to the Origins of Irish Pike.
- 3) Addition of new Section 5.1.4 The Spread of Freshwater Fish and Fauna by Natural Means.
- Renumber and edit of existing Section 5.1.4 to 5.1.5 Section Summary Conclusion: Current Research Relating to the Origins of Irish Pike.
- 5) Addition of new Section 9 Parameters for Successful Brown Trout and Pike Co-Existence. Section numbering for all sections after new Section 9 incremented by 1.
- 6) Addition of new Section 10.3.2 An Example of Dietary Crossover Between Perch and Wild Brown Trout.
- 7) Addition of new Section 10.4.4 Lough Ennell: An Example in Improving Brown Trout Stocks by Addressing the Real Issues.
- Addition of new Section 10.4.5 Lough Leven: An Example in Improving Brown Trout Stocks by Addressing the Real Issues.
- 9) Edit of Section 15.3 International Best Practice. Section number formerly 14.3.

### 2.2.1.3 - 4.1.1.3 FULL TEXT OF BARBE, F & GARRETT, S (2000) RESEARCH

#### THE PIKE IN IRELAND : A (NECESSARY) REVIEW

#### Part I: Lite

The Datch legging perturbation from Autoritance on which expanded are one of the shear indiscretisk serieurs of the 20<sup>45</sup> constant, the series of the bands, there is 0 kinds of singling and constitution to serveral singling comparisons. While the optimal the 0 gap method retrings where the jets and presents of findings or persons on the second house the field supply reasons. Must importantly, his writings have the foundations for a gapwerd beford and acceptance that catch-and-releases fielding is a very important superi, necessary to protect our sport, given the inservated pressure of publicion, ever fielding etc...

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During the gillisetting compaign carried out by the Wortern Regional Fielderics Board on Langths Mash, Carrib and Carra in winter 98 and spring 99 a paramete debate look place in the local and notional press. One contributor works the following in ane of his tetras: ("...plaks, a placeware whom trick same is "Gall East' or foreign fish... should therefore he removed from these lakes..." A dust while later I was taid by an Irish speaking person living in the Gallacht that this was incorrect since the Irish for place was "bit.".

Since then, my good hieral Shans Garrett and I, together with the help of memorous very kind and helpful people, have gans through pilos of indernation and documents, in order to parele together the bistory of brich pilo. We have also forward on arguments brought forward by Trick Fiberiers. Scientists claiming that pile are of recess introduction. More than one year later and abliengh our work in far from finished, we would like to share our finds, to date, with help internative Indeed, we cannot arrees a number of very intervoing references.

Let's first of all solve the "gall inser. - line" problem. Open any Irish dictionary and you'll see pile being translated as bins. Some dictionaries however mention gall inse as well, it supports that gall inser is a literary outsnay, a crustion from the 13% or the this rentrary. The original word for pike, line, is much older. Although it is impossible to plaquist exactly when it new first need it approves that line derive from somewhere between the 15% and the 14% context, calibrating that pike conductory well have been an this island much longer than we were always led to believe...

THE PIKE IN TRELAND | A (NECESSART) REVIEW

#### Part 1 - Roat

In 1977 Arthur E.J. Went wents "The Pike in holand". It was published in The Irish Naturalists' Journal. I can recommend the reading of these jenerads to anyone with an interest in the latency of Irish nature and withfilly. A white's ecousing by the open flot, fueled with a glass of your forestic details becomes a real locat when reading through these Journals.

Went way a marph historian who wrete several articles about briek field, in the altery mentioned publication Went came to the conclusion that "...b would containly appear that it (the pike text by its set an autive thit, " to come to this helded Want some up a membra at references and it has been extremely interventing to look into these in detail. It is important to point set that Went's work is still the main foundation of the pike's introduction theory held on to by the Islah Flaheriny.

Part of his introduction theory relies on the absence of an old Irish name for piles. Next also writes that " the more modern name for pile is galillass, which likesily means strange or livelyn floh." In the first article na have shown that both conclusion are invertex.

It is of extreme importance to note that Weat did not investigate the brick need Link (meaning pike and presentably during from somewhere betwares the  $10^{10}$  and  $15^{10}$  vorture). It was the word Link approach several states in archites published in The brick Naturalistic Journal written by other sourcements. It weren highly and lated that we shall be a state of the source of these Journals. Did Weat ignore "Links"? If so, why?

We come to the heart of Wear's introduction theory when he brings up his kay willowin Grahken Cambranis, Circhela Cambranis was a Webb architectus who visited behauf as two seconds at the and of the trueNM contary. He wrete the "Tapagraphy of Ireland", Weat games Cambranis in his article as fadows:

... The revers and the lakes are cick in fish peculiar to themselves, and expectally in fish of tirey kinds, namely, subwan, towar and mod-ech. ... But some first fish are wanting. I mean pile, perch, reach, gandon and godgeon. Minnow, lowch, bullbouth, versars, and nearly all that do not have their suminan origin in fide times are about also."

Now let's have a bask at the original translation of Cambrowski' writing. I quote from the same parage,

"The rivers and the lades are risk in fish possilar to themselves, and expectally in fish of three kinds, namely, solution, tront, and modewich. But some fine fish, found in other segions, and some manufacture fixed-water fish are wanting. I mean pile, peech, much, people and pedgeon. Missions, have, hallbands, summer, and nearly all that do not have their seminal region in tidal sizers are absent abs."

The underlined part of the latter questation was smithed by Wood in his settick, I have to stress on the extreme importance of this "ministate" in Went's work. We know that Cambrowit was in parts of the Southeast of the country and he might have wavelled minand, When Cambrowit werts "...found in other argona...", did he mean there was plike etc. in other parts of the country? Why did Went omit this sized parage?" The kilds Fisherins have always seen the gall insectionary as a solid hand to privat their introductions theory. They have scaled down this theory to the heliof that gail into it the brick word for pile used in some parts of West Mays. Incorrect equits, I'm alread in The Irish asteroithst Journal, Volume K, 1962-46, an orticle "Local numers of brick Fishes" by G.P. Farran is published which mentions Like for Mays. Not a mention of gall inter, Tagether with this argument it is after soid that pile ensated to native portune are lakes where piles are observed. It appears in me that it is very difficult is defined this argument. There are numerous halos where no trend or solmess can be found but do we see them therefore as introduced?

Bedder, to say that gall lase means foreign fish is in itself all tao simplishe and incomplete. White lase means underskindly fish, gall can mean foreign but can also mean "foreigners." or "Gauf" or "Noreman". The word gall inse therefore does not prove at all full pike is an introduced fish species.

Another argument of the introduction theory is that there is no old leich name for plin. Unlike for spectra like informa and reset which both have aid brich names. Some field at first sight but doesn't mode some either I'm straid. Let's give one only them and/or authors is thought. Or the real marks. I think screyons will agree that there are matter species to the leich coasts, 'tet, they have no old brich names' the could also look at our feathered triends and notice that a bled like the participe his no old leich name, yet is native to this country. In other words, the fact that pike has no old leich name does not preve anything. Sareh and that it is introduced.

Our "flast" of the word Linn has preven very important sizes. The word keeps coming back in different publications and references and it will prove to be very significant indeed as these series of the highly interesting journeys along the birtsey of Irish pike unitids.

So far for the introduction. In the next article we bring Dr. Went upon stage, and then it gets really interesting!

Text : Frank Barbi and Shane Carvett

This points miniposition by West is the point of discussion here. However, Combrensit' work detaild and he given more credit than it deserves. Enderd, same analemics have their disable about the value of Cambrensh' work. One of the reasons being the may in which he described brokent :

"On the whole the land is low-lying on all sides and along the coast; but towards the centre it rises up very high to many hills and even high mountains.

<sup>10</sup> We all know that it is just the other way around. Mountains around the countiles (Bicklow-Xeery-Consements...) and flar in the Malands. This mittake of his is sufficient to conclude that he did not say great parts of the county. Conferentia also give arounds of "a flab with three gold next" and "a same that was half an eq". Up to today Gradese Cambrennis is still regarded as a reliable witness by the Irish Fisheries.

Reading on in Went's article we come across the following passage :

"...we find in A.K. Longfield's 'Angle-John made' in the 16" contary that pile were exported in the early part of that century to some of the smaller sowne in the soath of England. We do not know, of course, the origin of these fish."

Let's quote from A.K. Longfield's 'Augh-Irish trade'direct new 1

At the end of the fifteenth contacy and beginning of the stateenth, however, they tithis is the pile) appear as coming regularly from Yonghal, Dangarran, Cort and Elexale to the Cornish perts...\*

These important observations can be made here. Firstly, why did Word question the origin of these Irish pilot, exported in England? Whereas it says clearly, in the book where he refers to, that they came from several named Irish towns.

Secondly, Longfield monthous the export of piles to England from Iroland at the end of the fibronic century. Further in the name book we over find a detailed reference of export of piles from Iroland to England in 1492. Why does Went ignore these pre-sistentih century references to pile?

Thirdly, if there was a floring trade of plice in behand at the end of the Effected contary they must have been protty widespread by these and could hardly have been introduced recently. (If introduced at MC)

Went's article "The Pike in Indand" contains more references to support his introduction theres, Same of them relate to paysmal notes of individuals which therefore cannot be looked into. Others will need verification. Yet, it is clear that his work contains arrive description.

And there is something elso. Which is, again, of major importance, Arthur E.J. West worked for the Fisherics Branch of the Deportunest of Appications and was a founding truster of the Salamon Recent Trust. Propie who have but twich that he was a serdeducted power angles who had no quest reports the fact that provide that is a finite truster of the fisher and an quest reports the fact that provide the sale. This spins much as which we appear to the fisher trust and the fisher that the neutron statistic of the trust provide the size trust which there are also as which and a different With this hardwards of the fact the sound which the sale and the same shale?

Considering the evidence of observousings in his work and the situans coeffict of interests should we regard Dr. Went as a collable source?

In the next article we will known some more bricks in the "introduction-wall" the irich Föheries have built over the last century as we will make the single most important revelation in our series on the history of pike to far...

Text : Frank Barbi and Shane Garrett

## 2.2.1.3 - 4.1.1.3 FULL TEXT OF BARBE, F & GARRETT, S (2000) RESEARCH CONTD.

#### THE PIKE IN IRELAND : A (NECESSARY) REVIEW

Part 1 - Of Pile and Parts

Before getting to the heart of our third article on the history of pike in fredand we need to charify an often held missanderstanding. There is an concrete evidence to suggest that pike are an introduced species in Ireland. The introduction theory is based on references that have been regarded over the last contary by the Irich Fisherics an conclusive. This is only a theory. In our first two articles we have shown that some of these enformers are incomplete, incorrect or even mislending. Others we regard as naïve and sarely not conclusive somigh to classify pike as introduced. One example...

Around 1960 a commercial fisherman on Lough Com catches a fish which he cannot recognize. Subsequently it is identified as a pile. This isocident is one of the reasons why the current Research Department of the Central Fisheries regard pile as introduced. When resulting the "Domanday flow, of Massmooth File" by Fred Bulles, one erouns arrows several specimen pile caught on Lough Cosm during back as far as 1878, (One such specimen is currently on display in the Natural Illatory Massum in Dublin,) in other worth, at a time when sure commercial fisherman caught the fish he could not identify, other people were claiming 48 and 50-peoplery from the same take! Clearly, pile must have been around for quiet a while if the lake was able to produce such monster fish. The field determination skills from our friend seem to be in line with the science the Fisheries are serving as.

Let's conclude with a noteworthy passage from the same book :

Lough Count, where big piles and hig treas once attracted a certain type of followinon (the big-field mast) from all over Europe, now cuters in these who are content to take a more certain bag of smaller field treas). This change is due principally in the systematic destruction of pile." The bank was written in 1979.

Let's more on and look into another reference on which the introduction theory is based. We quote from a letter we received from Mr. P. Fitzmanries, Director of Research of the Central Fisheries 1. "A review of binarcical fish annals carried out in the 1950's found on reference to pike in any documentation prior in the 19<sup>th</sup> Century."

We pressure Mr. Fitzmanrice refers to the article "The Pike in Ireland" written by Arthur E.J. Went in 1957. We dealt with Went and the contents of his work in our second article. However, spart from proving that Went's work was incomplete and parts of it incorrect, we sho discovered a few more interesting facts that prove Mr. Fitzmanrice's quote highly doubtful.

"Regimen as Nikime" is a medical text from v. 1420 which contains references to pike. It is an trick translation of a Latin medical tract which originated in Ruly, Interesting to note is that the person who translated the text (in the early 15<sup>th</sup> century) used the Irish word like for pike, rather than merely transliterating the Latin Incius. In appears that the Irish translater was already familiar with the Irish word for pike. Since the original Latin text of this work was written in Ruly, the references to pike are not directly referant to the presence or absence of the Rule in Iroland. However, the fact that the Irish translater knew of an Irish word for pike seems proof to us that the Rule species secured in Ireland early 15<sup>th</sup> Contory. For the sceptical ones among as we will back up this theory and take it one step further.

The Irish Grammatical Tructs are a collection of rules of grammar and diction which avoisted student poets in learning their craft. We will quote one such short poem which was written on 1480 :

"do spoilt gielle pig dan philo

de Minig Sin na Simme sam."

It was Chinese to as as well on we got the experts to translate it for as. The translation sounds as follows :

"The young man split a branch of the fir-tree,

he entired up the pike of the Shannon."

This passes brings on the conformation that there was indeed plice in Iroland, more precisely in the Shannon, ex 1400 and that no one found this remarkable. That no one found this remarkable leads as to conclude that they were there for quiet a while. It is immpting to draw further conclusions considering the honorests of kilometers the Shannon every and the numerous big and small lakes it connects.

The importance of the two above mentioned references taken into account we can rest assured that the chain that there was no (reference to) pike in Fedaral before the 19<sup>th</sup> Contary is sublated and incorrect. After 40, the review this current Research Department of the Felde Federeics have themselves on dates from the middle of the 20<sup>th</sup> Century...

In our final article we come to the conclusion of our series on the history of pike in Ireland. We will approach the pike's history from a few other angles, and bring up a few sources which counsider the pike as being native to the Irish country...

Test : Frank Barbi and Shane Garrett

#### THE PIKE IN IRELAND : A NECESSARY REVIEW

#### Part 4 : The Exes-Files Conclusion

With this article, we exame in the conclusion of our series on the history of pike in Ireland. We chould add however that we are currently preparing a special appendix to our story, in which we will focus no councrustion. As our research into this intriguing subject has become an ongoing process, updates can be expected. Before we start drawing conclusion should be significance of the contexts of our weiches, we will first of all look at the pike's history in Ireland from a few ether angles.

#### Native or and?

Although it seems almost sure that pike have spread in certain parts of the island later than in others, anabody has ever periodical concrete evidence of its introduction. Indiced, issue sources chain pike as being antire. In 1990 Bohert Linyd Praeger wente "The Nateral Bhatesy of Dreland", in which he chaodles the pike as an helm native field species. One handered years before that, William Thomson notes pike as being matter. Andh Marc Doushandl from County Mouth wrote a tract on natural kintery in the same period. File is the first facts he mentions as being matter. He discusses in it change period. File is the first facts he mentions as being matter. He discusses in it change are addy years before that. However, it is still tray interesting to save that the pike was no catchildness part of the pikeste found in C. Menti in the cause of the pike was no not referred part of the pikesterial notice. The discussion of 10<sup>th</sup> century and was not referred to an being introduced but classified native.

#### Other species in other countries.

In our ensuresh we have not limited surveying 'insident' which give hope of anesoting Europe and come serves assured interesting 'finishest' which give hope of anesoting the pike's history here. Our first steps is Spain and we must two old Friends, Arthur Went and Giveldes Combrends. The latter was referred to in a publication of The Frich Networks' Journal written by Arthur Went in 1949, Went relies on Combrends' havebody but as we already have, both are not "the perfect example of a reliable witness': Went quests Cambrends, but we this channel that "ne part of Spain problem pile". A case public of a pile in Northern Spain draws in the Yone Apps prove that they were not introduced and that once agels Cambrends and Went had it wrong.

Next we go to Holland where in the  $20^{10}$  Contery a discussion took plane whether the ratifield was an indigenous species that should be protected or whether it was introduced in the late moderal period by masks. It was only in 1979 that field remains from a member of prehistoric wethinness were identified. It appeared that earlied week present in The Netherlands some 400 years BC. The poor mask who alongity webbled his way with balen backet to the Datch waterside was innecent...

Chair to home we arrive in England where the teach has been regarded as an introduced species. Truch is a warm water dish which readd not have serviced the lerage, altegohly. Recent succession in Setfleds carried out by the Tana Team found not only pike her also truch reads. They were some 400,000 years old. Teach may now be expanded as antire over there.

Our trip around Europe brings us home again and even here we can serve you a prefect example of how theories are only theories. The endd is often classified as an introduced lish species to frisk waters for reasons similar to the English teach. Until radid remains papped up in excensions carried not in Parthraddan Care in Co. Antein. This find dates from the first half of the 20<sup>th</sup> Century and puts the presence of radid in feeland back to the less Age.

We thought it was important to quote these different examples. If only in wars the readers not to pass out if homereve pilor remains of a couple of thousand years old are homed in lockand. Stranger things have happened...

#### Some conclusions

Several conclusions can be drawn taking into account the pilks's turbulent recent history in feedand. The first one should be that there is much more work to be done and many more references to be backed into. Numerous people in thereins and universities have told us that there is much more interesting information "suit there",

Archaeologists have bardly legues looking into the penalste presence of fish remains in recentration sites. Understandably, houses areliants and tidal settlements have always carried the prime interest. Having solid that it is very resonanging to see that Aidan O'sufficus who brack the archaeological Discovery Programme takes a grant interest in Lake Settlement. Hopefully they'll think of an when they find a low fish boson?

Derived from this first conclusion we must been as the frish Fisheries and the work they have carried out as far in this control. During this artes on the binary of pilo in Perform and in adopted introduction we have prevent story on summersus accessions that there is something wrong with the introduction theory. It is not sure at all that pilor are introduced and memorous references as which they have built this theory are destrict, incomplete and even wrong.

This bands to our makin conclusion. In one prace's research we have found more about the pike's history than the Irish Fisheries did in half a century. While we are sarely very deficient in what was are doing, we are not mismion and he not have for example regular access to National Libraries and Meseume. Everything had to happen in our space time and living in two different countries sarely dial' make it enable for an The Piberies have their sens train of scientists, even their even Rorearch Department. If they didn's meseage in find in 50 years what we found in our year then there is assure that assume and keep building their policies on the interact Day and this but they didn's measure and keep building their policies on the interactional first way then there is navely remove the deput building their policies on the interaction form there is assuring anyone and keep building their policies on the interaction for their deputs are to a surely remove the deput building their policies on the interaction form the theory then there is navely remove for drastic change. It is nor opinion however that hardly anyone ever total asymems and keep building their policies on the interaction for a lick of evidence. There should the an official review and the deputy isolaid happing to find where anyone the deput building of a sure opinion however, but execution of all discriminatory measures against pike notificat review is example. We cannot durin even actions. This cannot be tolerated any lenger, More than this an official imprive into the isolat ofter pinkeep in the lick Picheries have played wither than official party induce review actions. This cannot be tolerated any lenger, More than this an official imprive is on the agends in the lower there is another than an official imprive is on the agends in the North, histories is acceled. We have that an official imprive is on the agends in the lower there is another that an official imprive is not the isolat official review has the harder is anofficial imprive is on the agen

#### Request

Before rounding off we would like to ask anyone who thinks he or she might have interesting information or stories to add to our research to come forward and help on with our quest. Any bit of information, however small it is, is welcome to help complete the puzzle. We can be constanted via emild at <u>limit infinite.</u>

#### Acknowledgement

Summing up a list of all the people who helped us in compiling these articles would force us to write another article? This would lead us too far to everyone who knows he ar she contributed is kindly thanked. We wish however to coalse two exceptions. First of all we would like to thank the Editor of Angling beckned Frank (we prevented to the prevenspace to show our fluctings. Anyone reading this should realize how locky freiland is, in faving a fishing magnetize that is not howing to influential groups like advertiors, rishs or organization regarding the contrasts of its articles.

Secondly we would like to mention and thank Nicholas Williams, Head Lectures of The Irish Department, University College Dublin. He never tired of our requests for information, explanation and translation. He led as to unnernous references and other people and without him this they would more than likely never have been written. We would like to finish by questing Me, Williams directly 1 "More research would, I am meet, yield more evidence that the pile is indigenous."...

Written by Frank Barbi and Shane Garrett

## 2.2.1.4 – 4.1.2 SECTION SUMMARY CONCLUSION: PAST RESEARCH RELATING TO THE ORIGINS OF IRISH PIKE

The analysis of the information presented in Section 4.1.1 and its subsections show that prior to 2013 the basis for the designation of Irish Pike as non-native was anecdotal, inaccurate and unscientific. The erroneous classification of Irish pike as non-native lasted for over six decades.

Of particular concern is that the leading fisheries scientists of IFI and its predecessors have apparently accepted this erroneous classification without question. Indeed, the extensive research carried out by Barbe and Garret in 2000 has to our knowledge, never been disputed by IFI or its predecessors, over the past 16 years, yet the pike remains officially 'non-native' to Ireland.

The closing statement of the Barbe, F. & Garrett, S. (2000) research is of particular relevance and reinforces the depth of their research and the external support they received from independent experts within the field of Irish culture and history. **"Secondly, we would like to mention and thank Nicholas Williams, Head Lecturer of the Irish Department, University College Dublin. He never tired of our requests for information, explanation and translation. He led us to numerous references and other people and without him this story would more than likely never have been written. We would like to finish by quoting Mr. Williams directly: "More research would, I am sure, yield more evidence that the pike is indigenous.".** 

It is the conclusion of this section that the 'non-native' status of Irish pike based upon past unscientific research is erroneous but also potentially disingenuous.

## 2.2.1.5 - 5.1.4 - THE SPREAD OF FRESHWATER FISH AND FAUNA BY NATURAL MEANS

There exists a substantial body of evidence within the scientific community supporting the spread of freshwater fish and fauna by non anthropogenic means with particular reference to avian transfers.

There are many examples throughout such studies of freshwater bodies that have been formed naturally or created by man (ponds, reservoirs etc.) that are isolated and initially devoid of fish. In many cases, following colonization by water fowl, fish species begin to appear. It has been proven that fish ova from certain species can survive within the down of water fowl for considerable time and be transported over hundreds of kilometers in many cases. Additionally the survival of freshwater organisms, including fish ova, within the digestive systems of water fowl has been proven (van Leeuwen et. al. 2012).

Specifically in relation to pike and perch, studies by Fr. Scheimnz (1925), Kammerer (1907), A Thienmann (1950) and O Preusse (1925) have shown the transfer survivability of ova from these species with live fry successfully hatching from eggs found in duck faeces following transfer from one water body to another.

100 Regilizit million from the or e shut in the h chapter on "Transport of aspartin animals by beels". I found an English translation of R.X. Translation No. 57: Final 4 attached. It is interesting Not more interesting F. 1825. Tish egg trainmer against six transport (in German). Alter North P.L. freeherier, has beene ferrer (1.s.p. 465). To has been established through og I find the paper he is o apprelaters that the asses of frage and timbs on also makin in the sir in most party to the high life be requested and data writing, oper another paper is cited. Pecalle O. 1927. How do field disperse. IL (In Garman), The author maniform that he di siggs in Ande Sanos. A line days here thy of Then twise hardwell from them. Flows the improvement that this is a anteni dispersal timally not consideral but possibly very important. If model 1 out prepare English estimates whitevel his manufer for Development interving versions fample, and all the atiline for spectra on Descelle. (Mail 100, p. 16). ut M. aut fork o d of sate terentetta (organis erinet ettingi engenmente er ettintintette han, statt. Risk egen sen ert en telliseta itten Mar, minist far egentet er egentin st internet, which again types was proven against these data was as a second secon of all the loss intering, thereforements from the source constructed and comparing last 1.1.1 and has been even to be a New Address Transferrer in control of againe of the Marty Lemma (Mart), only productive of the Marka in Sector's adjuster, at these further sects, speed by ever bires (the Lemma of Recomments in the Middle Maine, Pool of the Attrinits Deckstadt-Refitien an the Upper Rhise) (LAUSSINGS 1918, p. 71).

## 2.2.1.6 – 5.1.5 SECTION SUMMARY CONCLUSION: CURRENT RESEARCH RELATING TO THE ORIGINS OF IRISH PIKE

The fact remains that the scientific research of Pedreschi *et al.* (2014) represents the single most important and only piece of scientific research produced on the native status of Ireland's pike since the formation of IFI as IFT in 1951. The depth, robustness and scientific validity of this research has been illustrated by facing and easily discounting challenges posed to it generated by peers and others.

In relation to the EU Water Framework Directive, it is feasible to contest that the failure of IFI to embrace the new scientific research of Pedreschi *et al.* (2014), with or without further corroborating scientific evidence, places at risk, Ireland's successful achievement of at least 'Good' ecological status for all fisheries in Ireland. Furthermore, it would appear to contradict the statement referred to earlier and issued on 15th October 2013 by Dr. Cathal Gallagher, Head of Research and Development for Inland Fisheries Ireland, that "further investigations, using new and developing genomic techniques will be used to <u>endorse</u> these findings". The use of the specific term "<u>endorse</u>" suggests support of the previous findings, not contention.

IFI have expended resources, at a cost to the Irish tax payer, in undertaking research into Irish pike origins through the period 2010 to 2013. The findings of the resulting report **"Genetic Structure of Pike and their History in Ireland"** Pedreschi *et al.* (2014) have yet to be considered in formulation of pike management policy and hence the resources used in this study have yet to deliver any meaningful return to the Irish tax payer.

IFI must now recognise their own basic principles relating to fishery management as quoted by Dr. Joe Caffrey, (2008).

"P198 - However, it is the policy of the Fisheries Boards in Ireland to preserve our indigenous and naturalised fishes and to prohibit the introduction of non-native and potentially invasive species (National Policy for the Management, Development and Conservation of Coarse Fish Species in Ireland, Central Fisheries Board, in preparation).

P202 - Over the past century, only a few non-native fish species have become invasive in Ireland. Roach were first introduced to the Munster Blackwater in the south of Ireland in 1889 (Went 1950; Fitzmaurice 1984). The initial spread of this species was slow, but by the mid-1970s roach were becoming invasive and increasingly widespread in Ireland. Currently, roach are present in most river catchments in the country and may now be considered to be naturalised.

P203 - "It is current policy within the Fisheries Boards in Ireland to develop, manage and protect our native and naturalised fish species and to actively monitor and control the Introduction and spread of non-native species".



## 2.2.1.7 - 9 PARAMETERS FOR SUCCESSFUL BROWN TROUT AND PIKE CO-EXISTENCE

The study of parameters for successful brown trout and pike co-existence was undertaken by Catherine L. Hein et. al. in 2013.

## 2.2.1.7.1 9.1 LAKE AREA

Lake area is defined as a parameter for successful co-existence and Hein's study revealed that these species could co-exist in large lakes where the lake area was greater than 4.5sqkm. All of the designated wild brown trout fisheries in Ireland, where pike management is currently practiced, are far in excess of 4.5spkm in area as the table below shows.

Fishery	Lake Area (sqkm)
Lough Arrow	12.47
Lough Carra	16.19
Lough Corrib	176
Lough Conn	57
Lough Cullin	10.2
Lough Mask	83
Lough Sheelin	19

## 2.2.1.7.2 9.2 LAKE TEMPERATURE

Lake temperature is defined as parameter for successful co-existence and Hein's study revealed that a pikes propensity to catch wild brown trout prey is minimal at water temperatures less than 10degC. The table below shows average seasonal lake temperature for a typical Irish lake with a surface area of 89 square kilometers. The table shows that for approximately 6 months of the year typical lake water temperature is below the parameter discovered in Hein's study. It must also be considered that from May to June, as temperatures increase above 10degC pike feed principally on cyprinids and perch in great numbers as these species are concentrated for annual spawning. Pike consume up to 50% of their annual food intake in this period. As lake temperatures continue to rise from July to September larger pike seek refuge from warm water and aestivate (remain dormant) until lake temperatures begin to fall again.

Depth [m]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.5*	-	5	5.5	9	13	14	16	17	17.5	10.5	-	-
6	-	5	5.5	9	13	14	15.5	17	17.5	10.5	-	-
12	-	5	5.3	9	13	14.5	15.5	17	17	10.2	-	-
18	-	5	5.3	9	13	14.5	15.5	16.5	17	10	-	-
25	-	5	5.5	8.7	11.5	14.5	15.5	16	17	10	-	-
27	-	-	-	-	11.2	14.5	-	-	-	10	-	-
30	-	-	-	8.5	-	-	-	-	-	-	-	-
* Surface.												

## 2.2.1.7.3 9.3 EXISTENCE OF ALTERNATIVE SPECIES

Hein's study states that **"The total number of species in each lake was included to represent alternate prey species, which might dampen the interaction between brown trout and pike.".** Ecological changes in Irelands designated wild brown trout fisheries have seen the proliferation of perch and cyprinid species. The most recent studies of Irish pike diet (Pedreschi, 2014) have revealed that pike will prey upon the most abundant species present in a fishery, typically roach and perch.

## 2.2.1.8 – 10.3.2 AN EXAMPLE OF DIETARY CROSSOVER BETWEEN PERCH AND WILD BROWN TROUT

Studies undertaken by Dr. P Gargan on Lough Sheelin between 1983 and 1984 highlighted the level of dietary cross over between roach, perch and wild brown trout.

More recently the fishery survey "National Research Survey Programme, Fish Stock Survey of Lough Mask, F. Kelly et. al. 2015" illustrates clearly the level of dietary crossover between the species and the potential impacts of uncontrolled cyprinid and perch populations due to the removal of pike from the fishery.



Diet of perch captured on Lough Mask, June 2015 (% occurrence) n=55



Diet of brown trout captured on Lough Mask, June 2015 (% occurrence) n=19

## 2.2.1.9 10.4.4 - LOUGH ENNELL: AN EXAMPLE IN IMPROVING BROWN TROUT STOCKS BY ADDRESSING THE REAL ISSUES

Lough Ennell displays a similar trend to Lough Carra following the remediation of ecological factors affecting the lake and restoration of salmonid spawning habitat. It should be noted that pike management operations have not been conducted on Lough Ennell since 1990 and this has not limited the fisheries capacity to produce an abundant trout population. In fact, by addressing the negative environmental and ecological factors affecting the lake and its sub catchments and closure of the Lough Ennell Trout Hatchery, the fishery has reached its maximum potential to produce wild brown trout without the necessity for any form of pike management or control.

"the current largely "undisturbed" pike population, particularly in Lough Ennell, did not prohibit a significant increase in the adult wild trout population in this lake following the Shannon Regional Fisheries Boards successful stream enhancement programme in this fishery. Lake survey C.P.U.E. values for wild trout in Lough Ennell surveys from 2002 and 2006 ranged from 3.4 to 4.0 (Figure 8). The highest wild trout C.P.U.E. value ever recorded in a midland trout lake was 5.0 in Lough Sheelin in 1978 (Figure 6). Given that Lough Ennell has a significantly smaller euphotic zone than Lough Sheelin it is likely that a C.P.U.E. value for wild trout in Lough Ennell of 4.0 reflects this waters optimum trout carrying capacity." O Grady/ Delanty, 2008.

Note: The comment by O Grady 2008 in relation to Lough Sheelin is incorrect. IPS/ IFPAC have established that the trout density or CPUE for Lough Sheelin included both wild and farmed/ stocked trout therefore incorrectly elevating the trout CPUE value for Lough Sheelin. The correct maximum value for Lough Sheelin is approximately 3.68 therefore Lough Ennell, a fishery where pike management is not practised, holds the highest trout population density value for any midland lake and is substantially higher than Loughs Corrib, Mask, Conn and Cullin.

## 2.2.1.10 - 10.4.5 LOCH LEVEN: AN EXAMPLE IN IMPROVING BROWN TROUT STOCKS BY ADDRESSING THE REAL ISSUES

The most famous of all wild brown trout fisheries, Loch Leven in Scotland, has had a very similar history to many of Irelands wild brown trout fisheries. Responsibility for managing the fishery is with Loch Leven Fisheries who describe the Lochs history.

"Nowadays, catch records are not comparable as the majority of trout are caught & released but recent seasons have seen a discernible recovery in catches following several decades of decline. The factors behind that decline most probably relate to the deterioration in water quality that accompanied amongst other things increased population within the catchment area and more intensive agricultural practices. Measures introduced since Scum Saturday (13th June 1992) when a blue-green algal bloom created national headlines, have seen water quality improve dramatically as levels of phosphates / nitrates going into the loch have fallen over 60% from pre 1992 levels.

In former centuries, Loch Leven was about four miles long and three miles wide. But in December 1830 a drainage scheme was completed that dropped the water level of the loch by up to nine feet and reduced its area by almost a quarter. The scheme also involved cutting a new channel for the outflowing River Leven and creating sluices to control the flow of water from the loch.

The appearance of the loch before the drainage can be gauged by the visitor at the old churchyard of Kinross. Originally the water lapped at the foot of the churchyard wall. On Castle Island, when Mary, Queen of Scots was imprisoned there in the 1560s, the loch reached the battlements. Today the loch reveals seven islands, but prior to the drainage there were but four: St Serf's, Castle, the Reed Bower and Roy's Folly. Most of the loch is now very shallow, with the exceptions of two 6o-foot holes to the east of Scart Island and around the western and southern sides of St Serfs. Before 1830, the large area known as "The Shallows" was more than twice its present depth. This massive alteration has had major effects on the fish populations of Loch Leven. Salmon, and possibly sea trout, ran the old River Leven: they are gone. So too is the charr which, presumably, could not tolerate the shallower water. The pike too also almost became extinct here, but not because of the drainage: it was exterminated to protect the trout stocks (in 1903 14,000 pike were removed by netting). However recent seasons have also shown signs that the pike population could be on the rise again, so too the perch, both of which is encouraging as it confirms the loch is returning to rude health."

Similar to Loughs Carra and Ennell the remediation of negative environmental factors has seen the Lochs trout population recover to a very high level. Additionally pike and pike angling is actively promoted.

Loch Leven Fisheries (2014). "What the survey suggests is that, last autumn, they found just under 900 fish per hectare which measured 40mm or more in size. Although these will predominantly be brown trout, it will also include pike & perch as the hydroacoustic equipment does not differentiate between species. CEH quite reasonably tells us not to place undue weight on the absolute numbers (ie 900 fish per hectare) but they are pretty confident about the trend which suggests the fish population has doubled since 2011 and quadrupled since 2009"

Locn Leven Fonenes	Vices	P	eports'	Fighting Re	Finland	Home	(	R D	r
								en/isienes	Local
Dike Fiehing									Dike Eishie

In conjunction with the improving water quality, recent years have seen a significant recovery in the pike population to the extent that pike anglers are now fishing the loch again and catching specimens up to 26 lbs.

The majority of Loch Leven is shallow and weedy, this environment has presented no difficulty for pike and trout to co-exist and based on recent evidence the trout population has expanded without pike management operations in place.

## 2.2.1.11 - 15.3 INTERNATIONAL BEST PRACTICE

Inland Fisheries Ireland purports to implement pike management operations to the same standards as international best practice. Internationally, the use of gill-netting and electrofishing as methods of species control are deemed necessary, and in most cases only permitted, where the target species is non-native - pike are native to Ireland.

Internationally Loch Leven in Scotland is known as the best wild brown trout fishery in the world, a reputation it has held for over a century. Pike are present in Loch Leven with pike angling promoted at the fishery which now also boasts world class pike and perch fishing. Pike are not managed or culled by Loch Leven Fisheries.

Lough Corrib Trout CPUE


#### Appendix G

# The role of IFI science in informing policy and management in fisheries by Research Division, Inland Fisheries Ireland

(Note: Document Obtained under Freedom of Information -

Appended as considered Highly Relevant to the Development and Scientific Validity of the 'Long Term Management Plan for the Western Lakes' Proposed by Inland Fisheries Ireland)

#### The role of IFI science in informing policy and management in fisheries

The website of Inland Fisheries Ireland (IFI) states that the Research Division (RD) is involved in a broad range of fisheries research, including 'many applied fisheries management projects dealing with diverse pressing issues'. It is also noted that the RD is tasked with the provision of advice to the relevant parent Department. This governmental advisory role 'has increased significantly in recent years with advice offered on the management of most inland fresh water species and in relation to a range of fisheries related questions'.

The research and advice function of IFI RD is consistent with the purpose of similar groups worldwide, who strive to provide independent and unbiased scientific understanding which can inform policy and management. A close analogy is the Environmental Research and Development responsibility of the Irish EPA, which supports environmental research to 'identify pressures, inform policy and provide solutions in the areas of climate, water and sustainability'. Similarly, the UK agency CEFAS aspires to be 'the government's marine and freshwater science experts, working for healthy and productive oceans, seas and rivers and safe and sustainable seafood'. CEFAS claim that 'Innovative, world-class science is central to our mission'.

The provision of robust science by RD places IFI in a solid position to implement best practice evidence-based management (EBM). EBM aims to explicitly use the current, strongest evidence in management and decisionmaking, where the first principle is to employ published peer-reviewed scientific research that bears on whether and why a particular management practice is likely to work. The emphasis on scientific evidence provides an explicit means by which bias in the system can be minimised. This principle strongly contrasts EBM with weaker management alternatives based on subjective perception, i.e., hearsay, opinion, belief or advocacy. The key is that the scientific method represents an objective, transparent and reproducible framework for developing true understanding of the natural systems for which we are responsible.

Importantly, management and conservation are societal activities undertaken for people by people. As such, it is not absolutely necessary that managers implement actions consistent with scientific evidence. It may sometimes be decided to advance policy motivated more by political expediency, e.g., to reflect the perspectives of powerful advocacy groups. The critical factor in such a case is to acknowledge with absolute clarity where the departure from evidence takes place, and why it was deemed appropriate.

#### Pike project - Summary outcomes

Key findings from the Inland Fisheries Ireland (IFI) pike project were published as four peer-reviewed papers in international scientific journals. These journals are highly-regarded and report science that strongly informs fisheries and environmental policy worldwide. The papers have been well received, including winning an international award for scientific excellence. The set of publications highlight limitations and avenues for future research, but provide a solid foundation for evidence-based fisheries management at IFI.

#### International peer-reviewed scientific papers

(1)

2018. Coexistence of pike

Esox lucius and brown trout Salmo trutta in Irish lakes. Journal of Fish Biology, 93: 1005-1011. (3 Citations 2020)

Abstract: An environmental study of pike Esox lucius recorded their presence in 522 Irish lakes and that they coexisted with brown trout Salmo trutta in 97 of these. Statistical models, accounting for spatial non- 2 independence among lakes, suggested that lakes with greater area, maximum depth and stream connectivity show a higher probability of coexistence. Introductions of E. lucius are likely to have negative effects on S. trutta stocks in small isolated lakes, but coexistence may be possible in larger systems.

Abstract: Roach is an invasive cyprinid fish species that has been introduced to many Irish lakes, causing broad changes in fish community dynamics. This paper examines whether roach invasion is associated with temporal change in the diet of pike in colonised systems. The seasonal diet of pike in three Irish lakes was compared between a historical (pre-roach) data set collated on a monthly basis in the 1960s and 1970s, and recent samples collected monthly over 1 year in 2016–2017. Statistical models indicated a significant increase between sampling periods in the probability of observing cyprinids in pike stomachs, and corresponding significant decreases in the probability of observing perch or brown trout. Small pike were significantly less likely than large pike to have salmonid prey in their stomach. There were seasonal effects on diet, with invertebrates and sticklebacks being consumed more in Winter– Spring compared to Autumn–Summer. In the recent period, prey selection indices indicated positive selection for roach and negative selection for perch; indices for trout tended towards neutrality. The dietary shift in pike following the establishment of roach may have alleviated predation pressure on native trout (and perch), with implications for food web structure in invaded lakes.

(3) 2019. Salmonid Conservation in an Invaded Lake: Changing Outcomes of Predator Removal with Introduction of Nonnative Prey. Transactions of the American Fisheries Society, 148: 219-231. (2 Citations 2020)

#### Award for Best Paper in Transactions of the American Fisheries Society

Abstract: Culling of predators is a traditional tool in inland fisheries management. There is a long history of removing Northern Pike Esox lucius from certain Irish lakes in an attempt to enhance Brown Trout Salmo trutta fisheries. In recent decades, some of these systems have experienced on-going warming, eutrophication, and the establishment of large populations of a nonnative cyprinid, the Roach Rutilus rutilus. Availability of this abundant new fish prey resource may have modified predator–prey interactions between Northern Pike and Brown Trout and consequently the potential efficacy of Northern Pike removal as a trout fisheries management tool. Statistical analysis of long-term fish survey data (1978–2015) and Northern Pike removal data (1980– 2014) from Lough Sheelin, Ireland, indicated

<sup>(2)</sup> Shifts in diet of an apex predator following the colonisation of an invasive fish. Hydrobiologia 837: 205-218. (2 Citations 2020)

that the Northern Pike diet (stomach contents) changed significantly after the Roach invasion. There was a strong reduction in the proportion of Northern Pike stomachs containing trout, and the incidence of Roach in Northern Pike stomachs increased. Northern Pike removal was found to have a generally positive effect on abundance of Brown Trout in the following year, but this positive effect became neutral or negative at intermediate and peak levels of Roach abundance (>33rd percentile of annual survey CPUE). Brown Trout abundance also declined in years of high chlorophyll-a concentration. Removal of top predators may have unanticipated effects on target fish stocks in systems with multiple anthropogenic pressures.

(4)

, 2019. Evaluating

management options for two fisheries that conflict through predator–prey interactions of target species. Ecological Modelling, 410: 1-1. (1 citation 2020).

Abstract: When one wild species is food for another and both have their hunting enthusiasts, then conflict can arise. This is particularly true and complicated in fishing, where trophic links are strongly influenced by body size ratios, alternative prey are available, populations are strongly density dependent and all their parameters are hard to quantify. We examine this problem with a specific example of trout-pike interaction in Irish lakes using a multispecies size-structured population model, set within a quantitative management action assessment framework. We use an informal Bayesian uncertainty analysis to account for empirical imprecision and test a range of stakeholder suggested scenarios for management of the pike and trout fisheries, under three different hypotheses about the abundance of non-trout prey availability. Trout fishing always diminished adult trout biomass. Fishing for pike always increased trout biomass but less effectively as biomass of alternative (to trout) prey increased. Adult pike cannibalism was found to significantly alleviate predation pressure on trout when alternative prey was not plentiful, less so when it was.

#### Main scientific findings and considerations

#### t al. (2018)

A total of 522 Irish lakes were investigated, including 97 systems where brown trout coexist with northern pike. This is a really substantial dataset with good geographic coverage of the country. Statistical models suggested that relatively large, deep lakes with strong stream connectivity are likely to support coexistence of pike and trout. However, pike introductions to small low-complexity systems have potential for strong negative impacts on resident trout populations. Statistical uncertainty in the results may make it difficult to predict the likelihood of coexistence in a given lake.

#### et al. (2019)

The seasonal diet of pike in three Irish lakes was compared between a historical (pre-roach) data set collated on a monthly basis in the 1960s and 1970s, and recent samples collected monthly over one year in 2016–2017. The main aim of this paper was to assess whether the diet of an aquatic top predator (pike) changed after the arrival of an invasive prey fish (roach). The study dataset provided extremely valuable, long-term and seasonal insight into the dietary habits of pike in Irish lakes. The analysis assumed that differences in pike diet between historical and recent

sampling periods can be quantified, even though (1) only one of the lakes covers both periods, and (2) there are no relative abundance data for fish populations in the historical period.

The results indicated a profound temporal shift in the diet of pike in Loughs Derravaragh and Sheelin: perch and trout were the dominant fish prey in in the early period, while roach are now most important. Invertebrates were common in the diet of pike in both study lakes, but pike also fed on fish from very early stages in their life history.

Prey selectivity indices indicated that there were more roach and less perch in pike stomachs than would have been expected from the relative abundance of these species in the lakes, while the number of trout in pike stomachs reflected lake abundance. This result implies that pike now 'prefer' roach. It could be speculated that this dietary shift has alleviated predation pressure on trout. There were inevitable limitations surrounding the use of a 50-year old historical dataset: it was difficult to account precisely for total numbers of prey consumed in the early period, and there were no records of ambient prey abundance at that time. In addition, only one of the lakes had data for both study periods. However, results showed that the arrival of roach has been associated with a strong shift in pike diet from trout and perch in the historical period to current dominance by cyprinids.

#### et al. (2019)

The scientific literature reveals that the acceptability of predator control is often subjective and culling programs may be unsuccessful or have unintended consequences. The effectiveness of such actions should be evaluated based on available data and systematic monitoring. This study conducted statistical analysis of long-term fish survey data (1978–2015) and Northern Pike removal data (1980–2014) from Lough Sheelin. The results showed a strong temporal reduction in the proportion of pike stomachs containing trout, and a corresponding increase in the incidence of Roach. Similar results have been found in Lake Windermere. This marked shift in pike diet from trout to roach was associated with contrasting effects of pike removal on survey abundance of trout in the following year: pike removal had some positive effect on trout in years of 'low' roach abundance, little effect at 'mid' abundance and possible negative effects at 'high' roach abundance.

This result exemplifies the complexity of fish community dynamics and the likelihood that intuitive management interventions may have unexpected and potentially negative impacts. Abundant Roach populations seem to intermittently reduce pike predation pressure on trout in Lough Sheelin and modify the potential utility of pike removal as a trout conservation tool in the system. There may be 4 more utility in a focused program that addresses possible key predation bottlenecks, such as individual pike targeting juvenile trout out-migrations from natal streams.

#### et al. (2019)

The papers above are robust empirical investigations that make consistent conclusions about coexistence of pike and trout, temporal changes in pike diet and likely implications for management. These findings were used to inform a mathematical model, developed to express key features in the population dynamics of trout and pike, including predation by pike on trout and on alternative prey species. This size-based model has a very strong foundation in ecological theory, and follows a similar structure to models used widely in ecological investigations of marine fish communities and fisheries impacts.

Pike removals and the regulation of trout angling pressure were the management tools most frequently suggested by stakeholders for enhancing brown trout abundance. Management scenarios or action were represented in the new model through a combination of trout removal and pike removal mortality rates. Availability of alternative prey was specified as three levels ('scarce', 'moderate', 'plentiful') to address the potential effect(s) of roach abundance on tested management scenarios. The model scenarios supported empirical evidence that the likely effect of pike removal on trout populations will change strongly with the abundance of alternative prey, and is likely to be ineffective where roach are abundant. The model also suggested that angling is likely to have a stronger impact on trout populations than pike predation.

These results had considerable associated uncertainty, which mainly reflected extrapolation of pike and trout stockrecruitment relationships from other systems, e.g., Lake Windermere. An important unknown element is how trout and roach interact; interspecific competition between these two species may be mitigated by pike predation on roach

#### Summary conclusions

The ecology of the designated Irish trout Lakes has changed markedly since the 1960s, when these systems were reasonably pristine and the fish community was dominated by brown trout and pike. The lakes currently experience impacts from agricultural run-off, invasive species, angling and other human pressures. These factors probably interact to influence the fish community and the relative abundance of particular species. The impact of invasive roach populations is likely to be particularly important.

In this complex environment, the effect of removing a predator such as pike is difficult to predict and may be negative. The IFI studies suggest that pike removal may have benefited trout in the simpler fish communities occupying healthier lake systems in the past. This management practice is likely to be much less effective in the current impaired situation.

#### Specific recommendations following scientific findings and management implications

- The current process-based mathematical model of pike-trout interactions needs to be (1) extended to include a size-based roach population, and then (2) placed within a formal fisheries MSE framework. This full framework will support a feedback loop between adaptive management options and fish community status.
- 2. The MSE needs to be supported by annual empirical and model-based fish (pike and trout) stock assessments to evaluate conservation status, i.e., healthy/overfished.
- 3. These assessments require fisheries-independent survey CPUE, with records of fish size, maturity and gillnet selectivity.

- 4. A critical data gap is knowledge of pike and trout angler effort and catch. A voluntary reporting programme built around a group of enthusiastic anglers could provide a CPUE range. This estimate could then be extrapolated to the whole fishery based on periodic catch and effort surveys by IFI staff, i.e., how many boats fishing and fish caught in a day.
- 5. An important initiative might be case-study lakes (e.g., Sheelin and Conn), where comprehensive annual assessments would be conducted, including (1) fisheries-independent gillnet surveys, (2) voluntary angler CPUE for pike and trout, and (3) on-going environmental monitoring. These programs could be strongly supported by local interest groups.
- 6. A precautionary approach to fisheries management might (1) fix pike removal at the average of the most recent three years, and (2) reduce daily angler bag limits for pike and trout to one or two fish per day, until there was sufficient evidence that higher exploitation rates would not damage stock.

#### Queries on new pike management proposal from IFI development

The development section at Inland Fisheries Ireland has recently proposed implementing a programme in which anglers participate in culling of pike. This proposal does not seem to have any scientific foundation, and seems unlikely to provide information that will inform on the state of brown trout or pike stocks or predator-prey interactions between these species. Notably, the document lacks any consideration of authentic scientific evidence on this topic, including the recent and highly-relevant world-class research actually published by IFI staff. Some specific high-level but extremely serious concerns with the proposal are provided below.

#### **General comments**

- 1. Recent international scientific publications from IFI (see summary above) highlight that pike removal may have a neutral or negative impact on brown trout populations in lakes having established roach populations. What recent scientific evidence is being used to justify the removal of pike as a brown trout stock enhancement tool?
- 2. Does the proposed programme does fulfil the principles of citizen science? If not, should the programme be renamed to accurately convey that it is an angler culling programme?
- 3. A monthly study of the diet of pike has already been undertaken in Lough Conn results have been peerreviewed and published in international scientific journals. How will the proposed additional work convince international reviewers that it represents an advance on the published findings?
- 4. Will it be necessary to conduct an ethical review prior to involving anglers in culling of fish?

- 5. Who will provide training in appropriate methods of euthanization? There is an existing requirement that IFI staff be appropriately trained to euthanize pike for stock management purposes; this expertise would also be required for citizen scientists.
- 6. Existing IFI evaluations have prioritized the Owenriff catchment as per IFI rehabilitation plan and existing EU petition. Lough Carra has also been highlighted due to a low number of alternate prey species. There also needs to be greater protection for Loughs Melvin and Leane; these lakes must be protected from introduction of pike.
- 7. Other angling groups, e.g., the Irish Federation of Pike Angling clubs (IFPAC) asked for a cessation of S59 pike fishing competitions during the recent policy reviews. Does the proposed culling project adequately consider the needs of all lake stakeholders?
- 8. Which variables will contribute to the proposed 'stock management dataset'?
- 9. How will these data be curated and analysed?
- 10. How will the results be used to inform a scientifically robust brown trout management programme based in peer-reviewed research and international best-practice?
- 11. Has a feasibility study been conducted to support selection of systems where culling will occur? How many of the lakes occur in SACs?
- 12. The draft S59 authorisation mentions tributaries should these also be listed here?
- 13. Is designation as a 'brown trout fishery' sufficient to impose a culling programme?
- 14. On what scientific basis is it known that it is 'essential that pike stocks are kept under control'?
- 15. Is there any evidence that without such control 'much of the efforts to develop spawning habitat are negated by the impact of a large pike stock on the adult trout stock'? Is there evidence that the pike stock is 'large'?
- 16. Stock size is unknown for brown trout and pike in the target lakes. On what basis is culling effort being defined?
- 17. How will targeting 'key times at specific locations' provide an unbiased estimate of overall pike predation pressure on brown trout stocks?
- 18. How will rod and line sampling be designed to ensure that it provides an unbiased sample of spatial, seasonal and ontological components of the pike population?
- 19. How will the new data 'assist in the planned management of stocks'?

- 20. The principles of Citizen Science require clear objectives, e.g., a defined mechanism by which removing pike from a multi-species fish community will result in increased abundance of brown trout.
- 21. The principles also state that projects will generate new understanding and have a genuine scientific outcome. How will the proposed culling programme generate science that will pass international peer review as a sound basis for Irish fisheries policy and management?
- 22. The principles also indicate that citizen science projects must also consider and control for limitations and biases. How is this being addressed in the current proposal, e.g., has a statistically robust sampling design been defined?
- 23. What 'very specific conditions' will be required for angler participation in the programme?
- 24. How many pike will be removed, and what is the scientific justification for this number?
- 25. Culling fish and removing stomachs requires some expertise, and has significant welfare implications. How will it be ensured that an adequate and best-practice training programme is implemented?
- 26. Why is it important to collect pike across all seasons? Is this requirement a contradiction of the previously mentioned focus on spawning periods and locations?
- 27. Is there bias associated with targeted sampling, as opposed to using a randomized sampling strategy?
- 28. Is there a risk of misreporting associated with separating pike stomachs from fish?
- 29. Analysing fish stomachs in a robust and unbiased manner is a highly skilled and time-consuming process. Has an appropriate and acceptable method been proposed and priced? Is this method consistent with international best-practice and likely to produce results that will convince reviewers of IFI science and policy?
- 30. What protocol will be used to ensure that stomach contents are recorded accurately and to a sufficiently low level, i.e., to invertebrate species?

#### Queries on new pike S59 authorisation from IFI development

- 1. 'Competitor species' and 'coarse fish' are not mentioned in the IFI Development proposal. What is scientific rationale for this very significant addition in the S59 authorisation?
- 2. What is the scientific justifying an increase in the number of pike and other coarse fish species to be removed?

- 3. How does this sampling add value giving a national WFD fish sampling programme based on sound international scientific principles?
- 4. How much of an increase in fish removal is planned, and what additional/different outcome will this have for fish community dynamics and brown trout abundance in the management lakes?
- 5. What is the scientific basis for the proposed dates (February to June 2021)? Do these dates contradict the aspiration for sampling across the entire year as indicated in the proposed pike management plan?
- 6. Why does the document require recording of 'length and/or weight'? Are these to different metrics considered to provide the same and equally useful information?
- 7. Are there ethical implications for involving anglers in a government culling programme? How will it be ensured that all fish are euthanized in a manner consistent with the requirements of the Health Products Regulatory Body (HPRA), which evaluates the use of animals in scientific research?
- 8. How are stomach samples to be removed?
- 9. How will samples be transported, e.g., what sort of bags, freezing protocol and acceptable storage period? Note that freezing must occur immediately, or samples degrade.
- 10. Is there any scientific rationale for the numbers of anglers to be involved and the corresponding number of pike to be culled?
- 11. Where and how will anglers remove stomachs? Has a consistent, scientifically-justified and ethically acceptable protocol been defined?
- 12. Samples from fish stocks must be collected in a random and unbiased design in order to represent useful 'scientific information'. How does the current sampling plan capture seasonal, spatial and ontogenetic differences in pike diet, especially regarding piscivory?
- 13. How will the information derived from the proposed programme contribute to the 'rational management of fish stocks'?
- 14. The Clare River is not listed in the IFI Development proposal. Why is it mentioned in the draft S59 authorisation?
- 15. Have the risks associated with Lagarosiphon major been adequately considered?

#### Appendix H

#### Comparison of INVAS Biosecurity Ltd. Assessed High Level Objectives & 'Actions'

with Inland Fisheries Ireland Revised 'Actions' Contained in Section 11 of the

'Long Term Management Plan for the Western Lakes'

Action	Long Term Management Plan for The Western Lakes - Section 11.1 (Timelines)	Long Term Management Plan for The Western Lakes - Executive Summary (Table 1.1)	INVAS Appropriate Assessment stage 1 screening of the Long Term Management Plan for the Great Western Lakes - Section 3 (Table 3.1)	Comment
	The Actions outlined <b>b</b> The Tex	Note: below in Column B have been highlighted Red where t Highlighted Red indicates Original Wording that h	e IFI Have Revised The Actions, Post INVAS AA Scree as been Revised, Post INVAS AA Screening.	ning.
Section Introduction From Related Document	The actions required to achieve each of the High level objectives of this plan are listed in table 11.1 below along with the timelines for the delivery of the actions. These timelines depend on the provision of appropriate resources to carry out the actions. If adequate resources are not engaged in the delivery of the actions, their delivery may not happen or may be delayed.	Historically, a number of large limestone lakes in the west of Ireland have been managed preferentially as wild brown trout fisheries. In accordance with Inland Fisheries Ireland (IFI)'s most recent policy direction and their statutory remit for the management of Ireland's inland fisheries resources, seven lakes, primarily in the West of Ireland, are managed as salmonid waters. The emphasis of proposed management programmes for these lakes will be to protect, conserve and, where possible, enhance their natural attributes and native biodiversity which will, in turn, optimise their potential as sustainable wild brown trout and, in some cases, Atlantic salmon fisheries. IFV's interest in eels (EC Regulation (Council Regulation 1100/2007) for the recovery of the eel stock ), Arctic Char which are now only found in Lough Mask and Ferox Trout is also reflected in the plan. Through a series of targeted actions, connected to an overall strategy, IFI will coordinate programmes under 7 categories of High-Level Objectives (HLO). Each HLO aligns to IFV's Corporate Plan (2021 to 2025) and is summarised below with the associated series of actions:	Through a series of targeted actions, connected to an overall strategy, IFI will coordinate programmes under 7 categories of High-Level Objectives (HLO). A modified version of Table 1 from the Long-term Management Plan for the Great Western Lakes is reproduced here to provisionally determine if an action is likely to have any potential impacts on the integrity of any Natura 2000 site. A determination is then made as to whether a site should be further assessed due to the potential for uncertain or adverse impacts.	

HLO 1		Stakeholder	Engagement	
Action	Long Term Management Plan for The Western Lakes - Section 11.1 (Timelines)	Long Term Management Plan for The Western Lakes - Executive Summary (Table 1.1)	INVAS Appropriate Assessment Stage 1 Screening of the Long Term Management Plan for the Great Western Lakes - Section 3 (Table 3.1)	Comment
11	identify and engage with established catchment groups, trusts and associations to assist with the progression of common catchment management goals.	Identify and engage with established catchment groups, federations, Clubs, trusts and associations to assist with the progression of common catchment	Identify and engage with established catchment groups, federations, Clubs, trusts and associations to assist with the progression of common catchment	IFI Proposal differs from INVAS Appropriate Assessment and does not consider the views of national federations, clubs and all lake stakeholders.
1.2	Where such groups have not yet been established, engage local communities, stakeholders and relevant authorities in the protection and development of their river catchments through the establishment of more Catchment Management Associations for the Western Lakes.	Where such truth the such show not yet been established, Where such groups have not yet been established, engage local communities, stakeholders and relevant authorities in the protection, development and conservation of their river catchments through the establishment of more Catchment Management Associations for the Western Lakes.	Where such used in the protocol of the such groups have not yet been established, engage local communities, stakeholders and relevant authorities in the protection, development and conservation of their river catchments through the establishment of more Catchment Management Associations for the Western Lakes.	IFI Proposal differs from INVAS Appropriate Assessment and omits conservation objectives.
1.3	Enhance communication mechanisms and networks between IFI, catchment groups and relevant authorities.	Enhance communication mechanisms and networks between IFI, other relevant stakeholder groups, state agencies, farming organisations, academic institutions, local communities and catchment groups.	Enhance communication mechanisms and networks between IFI, other relevant stakeholder groups, state agencies, farming organisations, academic institutions, local communities and catchment groups.	IFI Proposal differs from INVAS Appropriate Assessment and now omits the views of national federations, clubs and all lake stakeholders.
HLO 2		Climate Action	& Biodiversity	
Action	Long Term Management Plan for The Western Lakes - Section 11.1 (Timelines)	Long Term Management Plan for The Western Lakes - Executive Summary (Table 1.1)	Appropriate Assessment Stage 1 Screening of the Long Term Management Plan for the Great Western Lakes - Section 3 (Table3.1)	Comment
2.1	Identify manageable factors which will contribute to the climate resilience of sensitive habitats and species.	Identify manageable factors which will contribute to the climate resilience of sensitive habitats and species.	Identify manageable factors which will contribute to the climate resilience of sensitive habitats and species.	
2.2	Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient and sediment run-off.	Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off.	Promote the establishment of significant aquatic buffer zones to enhance biodiversity and ameliorate nutrient /sediment run-off.	
2.3	Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity.	Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity.	Develop models to inform the strategic planting of native woodlands to mitigate the impacts of elevated water temperatures and increased flood frequency and severity.	

E OTH		Water	Quality	
Action	Long Term Management Plan for The Western Lakes - Section 11.1 (Timelines)	Long Term Management Plan for The Western Lakes - Executive Summary (Table 1.1)	Appropriate Assessment Stage 1 Screening of the Long Term Management Plan for the Great Western Lakes - Section 3 (Table3.1)	Comment
3.1	Enhance the capacity of IFI to detect and enforce water quality offences by increasing the number of fisheries environmental Officers working in the catchment areas of the Western lakes.	Enhance the current statutory powers of Inland Fisheries Ireland by authorising officers to enforce the relevant provisions of the Habitat Regulations.	Enhance the current statutory powers of Inland Fisheries Ireland by authorising officers to enforce the relevant provisions of the Habitat Regulations.	IFI Proposal differs from INVAS Appropriate Assessment and reduces responsibilities relating to Habitat Regulations.
3.2	Enhance the current statutory powers of Inland Fisheries Ireland by authorising officers to enforce the relevant provisions of the Habitat Regulations.	Enhance the capacity of IFI to detect and enforce water quality offences by increasing the number of Fisheries Environmental Officers working in the catchment areas of the Western lakes.	Enhance the capacity of IFI to detect and enforce water quality offences by increasing the number of Fisheries Environmental Officers working in the catchment areas of the Western lakes.	IFI Proposal differs from INVAS Appropriate Assessment.
8. S	Continue to improve and enhance working relationships with key environmental authorities in the western lake catchments so that information is shared effectively and increased efficiencies, with regard to environmental enforcement, are achieved.	Continue to improve and enhance working relationships with key environmental authorities in the western lake catchments so that information is shared effectively and increased efficiencies, with regard to environmental enforcement, are achieved.	Continue to improve and enhance working relationships with key environmental authorities in the western lake catchments so that information is shared effectively and increased efficiencies, with regard to environmental enforcement, are achieved.	
3.4	Removed	Provide information and assistance with the designation of nutrient sensitive catchments and areas for action.	Provide information and assistance with the designation of nutrient sensitive catchments and areas for action.	IFI Proposal differs from INVAS Appropriate Assessment as it has been totally omitted by IFI.
HLO 4		Invasive	e Species	
Action	Long Term Management Plan for The Western Lakes - Section 11.1 (Timelines)	Long Term Management Plan for The Western Lakes - Executive Summary (Table 1.1)	Appropriate Assessment Stage 1 Screening of the Long Term Management Plan for the Great Western Lakes - Section 3 (Table3.1)	Comment
4.1	Remove and/or manage harmful invasive species through a strategic stock management and weed management programmes.	Remove and/or manage harmful invasive species through strategic stock management and weed management programmes.	Remove and/or manage harmful invasive species through strategic stock management and weed management programmes.	
4.2	Continue to use digital and conventional media to alert the public about potentially harmful invasive species in the western lakes.	Continue to use digital and conventional media to alert the public about potentially harmful invasive species in the western lakes.	Continue to use digital and conventional media to alert the public about potentially harmful invasive species in the western lakes.	
4.3	Provide biosecurity advice and resources to stakeholder groups to prevent the spread of invasive species in the western lakes.	Provide biosecurity advice and resources to stakeholder groups to prevent the spread of invasive species in the western lakes.	Provide biosecurity advice and resources to stakeholder groups to prevent the spread of invasive species in the western lakes.	
4.4	Encourage relevant stakeholder groups to participate in the management of invasive species.	Encourage relevant stakeholder groups to participate in a range of conservation activities including the management of invasive species.	Encourage relevant stakeholder groups to participate in a range of conservation activities including the management of invasive species.	IFI Proposal differs from INVAS Appropriate Assessment and omits conservation objectives.
4.5	Enhance legislation and increase penalties for the transfer of live fish	Enhance legislation and increase penalties for the transfer of live fish	Enhance legislation and increase penalties for the transfer of live fish	

5 OTH		Stock Mar	nagement	
Action	Long Term Management Plan for The Western Lakes - Section 11.1 (Timelines)	Long Term Management Plan for The Western Lakes - Executive Summary (Table 1.1)	Appropriate Assessment Stage 1 Screening of the Long Term Management Plan for the Great Western Lakes - Section 3 (Table3.1)	Comment
5.1	Produce stock management plans annually, to reduce impacts on salmonids from other fish populations.	Produce stock management plans annually, to reduce impacts on salmonids from other fish populations.	Produce stock management plans annually, to reduce impacts on salmonids from other fish populations.	
5.2	Adjust stock management plans as population models on each of the lakes are refined.	Adjust stock management plans as population models on each of the lakes are refined.	Adjust stock management plans as population models on each of the lakes are refined.	
n, L	Enable local stakeholder groups to contribute to stock management and research programmes through a revision of relevant bye-laws	Enable local stakeholder groups to contribute to population modelling and research programmes (through citizen science).	Enable local stakeholder groups to contribute to population modelling and research programmes (through citizen science).	IFI Proposal differs from INVAS Appropriate Assessment and Implies that a Government endorsed angler culling program is supported in a further attempt to revise national bye-laws and to discriminate and marginalise all non-salmonid stakeholders.
5.4	Develop risk matrix for salmonids based on physical characteristics of each waterbody and the implications of these for predation.	Develop risk matrix for Atlantic salmon and trout based on physical characteristics of each waterbody and the implications of these as survival bottlenecks.	Develop risk matrix for Atlantic salmon and trout based on physical characteristics of each waterbody and the implications of these as survival bottlenecks.	IFI Proposal differs from INVAS Appropriate Assessment by applying a Pre-determined over- arching approach to promoting predation as the primary risk to salmonids rather than other aspects of the waterbody or physical environment that can be addressed and in addition, does not define the species for which predation is considered e.g. avian, trout, pike, mink, etc in the revised Action direction.
9 OTH		Habitat Re	estoration	
Action	Long Term Management Plan for The Western Lakes - Section 11.1 (Timelines)	Long Term Management Plan for The Western Lakes - Executive Summary (Table 1.1)	Appropriate Assessment Stage 1 Screening of the Long Term Management Plan for the Great Western Lakes - Section 3 (Table3.1)	Comment
6.1	Address the salmonid habitat deficits in the western lakes catchments through 3 targeted restoration projects per catchment per year.	Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects.	Address the salmonid habitat deficits in the western lakes catchments through targeted restoration projects.	IFI Proposal differs from INVAS Appropriate Assessment by capping the number of proposed restoration projects without providing any detail on the how this number has been reached, or the time or the funding required to complete the full restoration of all of the Western Lakes.
6.2	Streamline administrative processes to bring development projects through planning processes to fruition with maximum efficiency.	Streamline administrative processes to bring development projects through planning processes to fruition with maximum efficiency.	Streamline administrative processes to bring development projects through planning processes to fruition with maximum efficiency.	
6.3	Ensure that all relevant environmental protection processes are in place to avoid damage to other sensitive species and habitats.	Ensure that all relevant environmental protection processes are in place to avoid damage to other sensitive species and habitats.	Ensure that all relevant environmental protection processes are in place to avoid damage to other sensitive species and habitats.	

4 UTH		Rese	arch	
Action	Long Term Management Plan for The Western Lakes - Section 11.1 (Timelines)	Long Term Management Plan for The Western Lakes - Executive Summary (Table 1.1)	Appropriate Assessment Stage 1 Screening of the Long Term Management Plan for the Great Western Lakes - Section 3 (Table3.1)	Comment
1.7	Develop new and refine existing fish stock monitoring programmes (e.g. WFD) to provide the necessary data for specific population models for the western lakes.	Continue to refine existing fish stock monitoring programmes (e.g. WFD) to provide the necessary data for fish population models for the western lakes.	Continue to refine existing fish stock monitoring programmes (e.g. WFD) to provide the necessary data for fish population models for the western lakes.	IFI Proposal differs from INVAS Appropriate Assessment.
7.2	Use all available sources of data incl. Stock management and angling returns to feed into population models for the western lakes.	Use all available sources of data incl. Stock management and angling returns to feed into fish population models for the western lakes.	Use all available sources of data incl. Stock management and angling returns to feed into fish population models for the western lakes.	
7.3	Continue to develop climate models under current research programmes (CCMP) to improve resilience in catchments and species.	Continue to develop climate models under current research programmes (CCMP) to improve resilience in catchments and species.	Continue to develop climate models under current research programmes (CCMP) to improve resilience in catchments and species.	
	Removed	Develop a bespoke research programme with recommendations for the future conservation of all sub-species of wild brown trout.	Develop a bespoke research programme with recommendations for the future conservation of all sub-species of wild brown trout.	IFI Proposal differs from INVAS Appropriate Assessment as it has been omitted by IFI.

Attn: To whom it may concern I.F.I.

#### Re: Submission for the Draft Management Plan for the Great Western Lakes

#### Dear Sir,

Please find my submission regarding the above. Please note the following observations/conclusions.

- 1. I wholly support the implementation of a rescue plan for **The entire** system has been continually degraded for decades. We owe it to this generation and all future generations that we hand our inheritance in a better state that that which we received it. This is our opportunity to create our legacy and to save one of the last great salmonid lake systems in Europe. If we falter, we will carry the blame for our failure to respect the Environment and to adhere to the E.U. Legislation, namely the Habitats Directive and the Water Framework Directive. We just need to be brave enough and determined enough to stand up and stop the decline.
- 2. I personally cannot and will not accept the existence of Bye Laws 806 and 809 on No invasive species deserves the protection of the state. While pro-pike lobbyists may argue that pike are native on **and the invasive**, they have no proof. The **and the invasive** did not have invasive pike until their recent deliberate introduction (Aughrusbeg Lake). The geographic location of the **and the invasive** pike until relatively recently. Another simple example is the absence of **and the invasive** pike until relatively recently. Another simple example is the absence of **and the invasive**, is the **and the invasive** pike until separated from **and the invasive** pike until relatively recently. Another simple example is the absence of **and the invasive**, is the **and the invasive** only in recent times. The devastation caused to the system will cost millions of taxpayer's money to resolve. The most ludicrous element of 806 and 809 is that they are repugnant to both the Habitats Directive and the Water Framework Directive. Non native species are seen to

be damaging to the integrity of an SAC and must be removed. That is our primary legislation and it has been insitu since 1995. This must be corrected. Why has Ireland has over 400 proven environmental cases against us in the E.U. with 400 more cases pending? Are we incapable of understanding that an SAC is a political entity? It is a biosphere that requires that conservation measures must be implemented to preserve its status and specific biology and ecology. Minor lobby groups that advocate after the protection of an invasive species on a Salmonid SAC are conflicted and misinformed. They supply cannot have a say in its future.

Please remove these Bye Laws as soon as possible so we can get on with the restoration of one of the finest fisheries in Europe.

Regards,

Attn: I.F.I.

Re: Submission for the Great Western Lakes Draft Management Plan:

Dear Sir,

I am a riparian stakeholder from **Control on the shores of Control on the shore of the s** 

My family have been involved in angling for decades. We can't understand why the authorities are prosecuting people for removing invasive fish from our lake. This is ridiculous legislation. Please remove these irrelevant laws as part of this process.

Yours Sincerely,





# LOUGH CORRIB PIKE RESEARCH & CONTROL GROUP

www.loughcorrib.ie

Submission to Inland Fisheries Ireland

Public Consultation on The 2022 Draft Great Western Lakes Management Plan

September 20th 2022

## **1.0 INTRODUCTION**

The Lough Corrib Pike Research & Control Group is a voluntary team of local anglers and riparian stakeholders based around the shores of Lough Corrib in Co. Galway, who monitor the presence of non-native<sup>1</sup>/invasive pike (*Esox lucius*) in the lake and who control pike numbers with rod and line angling within current fisheries legislation (Section 59, Inland Fisheries Act 2010) for the benefit of our native wild salmonid species. The harvesting/culling of invasive pike with rod and line is an adjunct to the mechanical controls/stock management (gill netting & electrofishing) employed by Inland Fisheries Ireland (IFI) annually to maintain the integrity of Lough Corrib Special Area of Conservation (SAC) as laid down by the EU Habitats Directive (FIGURE 1). The coordinated culling of invasive pike stocks has been in train since 1898 on Lough Corrib commenced initially by the Corrib Fisheries Association (CFA).



Figure 1. Lough Corrib invasive pike management by rod and line angling

<sup>&</sup>lt;sup>1</sup> AA Screening - Lough Corrib Stock Management Plan 2019 - Inland Fisheries Ireland.

# **1.1 LOUGH CORRIB AT PRESENT**

While this public consultation process is solely concerned with the Draft Great Western Lakes Management Plan, we are taking this opportunity to highlight the gross contradictions and dysfunctionality within inland fisheries policy/legislation as it pertains to Lough Corrib Special Area SAC and its salmonid population. This dysfunctionality is driven by a covert agenda within the Inland Fisheries Division of the Department of the Environment, Climate and Communications (DECC) and elements of Inland Fisheries Ireland (IFI) to impose a mixed fishery model on every freshwater body in the country, in complete contravention of the EU Habitats and EU Water Framework Directives. This mixed fishery model can be simply defined as the validation and legitimisation through secondary legislation of all anthropogenic introductions of invasive coarse fish including pike to every watercourse in the country including SAC lakes and rivers. At present if known invasive coarse fish such as dace (Leuciscus leucisus) or chub (Squalius cephalus) were found to be present in Lough Corrib SAC, they would receive immediate legislative protection under the Coarse Fish Conservation Bye-Law No. 806, 2006. Unfortunately, there is a multitude of perverse individuals who are perfectly happy to defend this position.

On July 2<sup>nd</sup> 2020, the European Commission<sup>2</sup> issued a press statement regarding their decision to refer Ireland to the Court of Justice of the EU over its failure to designate Special Areas of Conservation (SACs), more than five years after the deadline expired. Under the Habitats Directive (Directive 92/43/EEC), EU member states must designate SACs, with specific conservation objectives and corresponding conservation measures to maintain or restore a favourable conservation status of the species and habitats present.

These steps need to be carried out within six years from the inclusion of these sites in the EU list as Sites of Community Importance (SCI). In the case of Ireland as of 2020, 154 SCIs (out of 423) had not yet been designated as SACs in the Atlantic biogeographical region, although the relevant deadline expired in December 2014. Site-specific conservation objectives had not been established for 87 sites, and the necessary conservation measures have not been established at any of the 423 sites.

<sup>&</sup>lt;sup>2</sup> https://ec.europa.eu/commission/presscorner/detail/en/IP\_20\_1235

On July 27<sup>th</sup> this year, after many years of procrastination, the necessary legislative measures have been listed for Lough Corrib SAC by the Department of Housing, Local Government and Heritage via S.I. (Statutory Instrument) No. 384 of 2022<sup>3</sup>, which completed the formal designation of the site as a Special Area of Conservation in accordance with Article 4 of the Habitats Directive.

Lough Corrib was designated a **Salmonid Water** under S.I. No 293/1988 European Communities (Quality of Salmonid Waters Regulations 1988) and as previously stated is a designated SAC (Special Area of Conservation) under the EU Habitats Directive due to the presence of Atlantic salmon a qualifying interest species under Annex II/V of the Directive.

Under current Inland Fisheries Ireland (IFI) policy<sup>4</sup>, Lough Corrib is a designated wild brown trout fishery where pike management occurs. This brown trout policy originally implemented in 2014 was supposed to be reviewed in 2017 (3 yearly intervals) but to date IFI have made no attempt to do so. Considering this failure by IFI to follow its own procedures and policy development processes, how will the IFI CEO influence any future salmonid policy on Lough Corrib considering that DECC are hamstringing the incumbent CEO at every opportunity with their mixed fishery agenda? Will he preside over another shambles just like his predecessor did with respect to the 'Pike Management Review (2016-2018)' or the 'Sea Trout Policy' development that was mysteriously shelved in 2017?

## 2.0 LOUGH CORRIB SAC

The Lough Corrib Special Area of Conservation (Site Code 000297) is situated to the north of Galway city and is the second largest lake in Ireland, with an area of approximately 18,240ha (the entire site is 20,556ha).

Special Areas of Conservation (SACs) are prime wildlife conservation areas in the country, considered to be important on a European as well as Irish level. Most SACs are in the countryside, although a few sites reach into town or city landscapes, such as Dublin Bay and Cork Harbour. The legal basis on which SACs are selected and designated is the <u>EU</u>

<sup>&</sup>lt;sup>3</sup> European Union Habitats (Lough Corrib Special Area of Conservation 000297) Regulations 2022.

<sup>&</sup>lt;sup>4</sup> Inland Fisheries Ireland, Brown Trout Policy, August 2014, IFI/2014/1-4233.

Habitats Directive (Council Directive 92/43/EEC of May 21<sup>st</sup> 1992 on the conservation of natural habitats and of wild fauna and flora), which is transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). The Habitats Directive was initially transposed into Irish law in 1997 by the European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94 of 1997), with later amendment regulations (S.I. No. 233 of 1998; S.I. No. 378 of 2005).

The aim of the European Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) is to create a network of protected wildlife sites in Europe, which are maintained at a good conservation status. The Habitats Directive formed a basis for the designation of Special Areas of Conservation (SACs). Similarly, Special Protection Areas (SPAs) are legislated for under the Birds Directive (Council Directive 79/409/EEC as amended by Council Directive 2009/147/EC) on the Conservation of Wild Birds). Collectively, SACs and SPAs are referred to as European sites or Natura 2000 sites in Irish legislation. In general terms they are considered to be of exceptional importance for protecting rare, endangered or vulnerable habitats and species within the European Union.

The Directive lists certain habitats and species that must be protected within SACs. Irish habitats include raised bogs, blanket bogs, turloughs, sand dunes, machair (flat sandy plains on the north and west coasts), heaths, lakes, rivers, woodlands, estuaries and sea inlets. The twenty five Irish species which must be afforded protection include salmon, otter, freshwater pearl mussel, bottlenose dolphin and Killarney fern.

Lough Corrib can be divided into two parts: a relatively shallow basin, underlain by Carboniferous limestone, in the south, and a larger, deeper basin, underlain by more acidic granite, schists, shales and sandstones to the north. The surrounding lands to the south and east are mostly pastoral farmland, while bog and heath predominate to the west and north. A number of rivers are included within the SAC as they are important for Atlantic salmon. These rivers include the Clare, Grange, Abbert, Sinking, Dalgan and Black to the east, as well as the Cong, Bealanabrack, Failmore, Cornamona, Drimneen and Owenriff to the west. In addition to the rivers and lake basin, adjoining areas of conservation interest, including raised bog, woodland, grassland and limestone pavement, have been incorporated into the site.

Atlantic salmon (Salmo salar) use the lake and rivers as spawning grounds. Although this species is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II/V of the EU Habitats Directive. The lake is a renowned salmonid fishery and is a designated **Salmonid Water** under S.I. No 293/1988 European Communities (Quality of Salmonid Waters Regulations 1988), this S.I. has been superseded by the EU Water Framework Directive. The lake has a population of sea lamprey (Petromyzon marinus), a scarce, though probably underrecorded species listed on Annex II of the EU Habitats Directive. Brook lamprey (Lampetra planeri), also listed on Annex II, are also known from a number of areas within the site. A population of freshwater pearl mussel (Margaritifera margaritifera), a species listed on Annex II of the EU Habitats Directive, occurs within the site. White-clawed crayfish (Austropotamobius pallipes), also listed on Annex II, is well distributed throughout Lough Corrib and its in-flowing rivers over limestone. The freshwater pearl mussel (Margaritifera margaritifera) is a freshwater bivalve listed under Annex II as mentioned and V of the EU Habitats Directive. It is legally protected in Ireland under Schedule 1 of the Wildlife Act (1976 (Protection of Wild Animals) (Statutory Instrument No. 112, 1990) and the now amended European Communities (Natural Habitats) Regulations (Statutory Instrument No. 94, 1997). Owing to its complicated life history and environmental sensitivities, it is a key biological indicator species for the habitat quality of river ecosystems.

## 2.1 OWENRIFF RIVER - PART OF THE LOUGH CORRIB SAC

The Owenriff is home to one of the most important populations of the freshwater pearl mussel in the world. It is certainly amongst the top four most important populations in Ireland. Unfortunately it has been in unfavourable condition since 2004, owing to degradation of its habitat. Ireland has reported twice, under Article 17 of the Habitats Directive, on the conservation status of the freshwater pearl mussel. On both occasions, the species was found to be in unfavourable bad and declining status.

The Owenriff River is part of Lough Corrib (SAC 000297) and salmon is a designated Annex II/V species. The conservation objectives for all species designated in this SAC are generic. In Europe, the freshwater pearl mussel (*M. margaritifera*) has been shown to use native brown trout (*S. trutta L.*) and Atlantic salmon (*Salmo salar*) (Young & Williams, 1984a; Moorkens, 1996, 1999). Ziuganov & Nezlin (1988) have proposed that the relationship of pearl mussels and salmon is symbiotic. The fish provides the essential step

in the mussels' life cycle, and mussels improve water quality by filtering water. If salmon numbers decline to the level where there are not enough fish to support the new generation of mussels, this would have a direct negative effect on the mussel population and the conservation objectives for the SAC. Although brown trout are not a protected species in the context of Council Directive 92/43/EEC, they are listed as a "species of conservation interest" at the site.

## **3.0 THE DELIBERATE SPREAD OF INVASIVE COARSE FISH**

Ireland is an island nation at the western edge of mainland Europe. The country was effectively separated from mainland Europe during the early stages of the retreat of the last ice age (Fitzsimons and Igoe 2004; Igoe 2004). This separation provided a physical barrier that prevented stenohaline species colonising from the East. As a result, Ireland has a relatively reduced fauna and flora (Igoe 2004). Ireland's freshwater fish community is far less diverse than that of Britain or mainland Europe. In respect of fish, Ireland has 28 freshwater species (Fitzsimons and Igoe 2004), compared with 236 in Europe (Moriarty and Fitzmaurice 2000; FAME 2004). Consequently, all of Ireland's indigenous freshwater species are euryhaline, having some degree of tolerance to salt water (Quigley and Flannery 1996; Fitzsimons and Igoe 2004). They include salmon (*Salmo salar* Linnaeus), trout (*Salmo trutta* Linnaeus), pollan (*Coregonus autumnalis* (Pallas)), char (*Salvelinus alpinus* (Linnaeus)), river Iamprey (*Lampetra fluviatilis* (Linnaeus)), sea Iamprey (*Petromyzon marinus* Linnaeus), brook Iamprey (*Lampetra planeri* (Bloch)) and eel (*Anguilla anguilla* (Linnaeus)).

Invasions by non-native species are a major threat to global biodiversity. Terrestrial and aquatic habitats can be negatively affected, resulting in grave damage to conservation and economic interests, such as agriculture, forestry and civil infrastructure. In some cases public, animal and plant health may also be threatened. Both Northern Ireland and Ireland have international obligations to address invasive species issues, principally the Convention on Biological Diversity, International Plant Protection Convention, Bern Convention, EU Water Framework Directive and the EU Habitats Directive.

"In the recent past, the majority of species introductions to Ireland have originated from Great Britain, also an island. Thus a filtering effect has been in operation, Ireland being the last land mass in a fragmented chain. As a result of its geographical location the number of introductions of alien species into Ireland has been smaller in comparison to much of continental Europe. However increasing global trade and migration over the last century have led to a marked increase in the rates of species introductions to Ireland, resulting in more frequent and noticeable impacts upon native biota.<sup>75</sup>

It is very evident from various IFI fish surveys that the deliberate anthropogenic spread of invasive coarse fish is a major problem in Ireland. This spread is the result of 'Bucket Biologists'<sup>6</sup> illegally moving fish from one catchment to another for their own egocentric gains. This activity in Ireland has been confirmed by Dr. Cathal Gallagher, IFI Head of Research and Development, in a submission made on December 10<sup>th</sup> 2015 to the Department of Environment, Community and Local Government regarding **Significant Water Management Issues in Ireland (SWMI)**. Dr. Gallagher made the following statement.

"The native Irish freshwater fish fauna has been augmented by a large number of non-native species (e.g. perch, pike, dace, bream, tench, roach and rainbow trout). These have been introduced either deliberately or accidentally, e.g. angling activities, aquaculture and the aquarium trade. A non-native species is one that has been either intentionally or accidentally released in to an environment outside of its natural geographical habitat range. Many non-native fish species have become established in the wild throughout Irish lakes and rivers, e.g. perch, roach, rudd and bream. Roach is a species which has been shown to affect salmonid production and cause a decline in brown trout angling catches. <u>Within a few years of being</u> introduced into a water body they can become the dominant species due to their high fecundity and they usually displace brown trout. Water bodies with non-native invasive fish species such as roach will not meet high status for EU Water Framework Directive (WFD) purposes due to the presence of these species. Future introductions of non-native species will also lead to a downgrading of the ecological status of a water body."

<sup>&</sup>lt;sup>5</sup> Stokes, K., O'Neill, K. & McDonald, R.A. (2004) Invasive species in Ireland. Unpublished report to Environment & Heritage Service and National Parks & Wildlife Service. Quercus, Queens University Belfast, Belfast.

<sup>&</sup>lt;sup>6</sup> 'Bucket Biologists' is a phrase coined by US wildlife authorities to describe individuals who want to illegally alter fishing grounds by stocking them with their preferred catch, usually invasive species.

## 3.1 THE EU WFD & INVASIVE COARSE FISH

The Water Framework Directive (WFD) was introduced in December 2000 with the broad aims of providing a standardised approach to water resource management throughout Europe and promoting the protection and enhancement of healthy aquatic ecosystems. The Directive, transposed into Irish Law in December 2003, requires EU member states to protect those water bodies that are already of good or high ecological status and to restore all water bodies that are degraded, in order that they achieve at least good ecological status by 2015.

Inland Fisheries Ireland (IFI) has been assigned the responsibility by the Environmental Protection Agency (EPA) for delivering the fish monitoring element of the WFD in Ireland. Surveillance monitoring sites are set out in the WFD Monitoring Programme published by the EPA in 2006 (EPA, 2006) and the fish monitoring requirements are extensive, with over 300 water bodies, encompassing rivers, lakes and transitional waters, being surveyed in a three year rolling programme. The main unit of management of the WFD across Europe is the River Basin District (RBD). A river basin or catchment is an area of land from which all surface run-off flows through a series of streams, rivers and possibly lakes into the sea at a single river mouth or estuary. An RBD comprises one or more neighbouring river basins together with their associated wetlands, groundwaters and coastal waters. The distribution of flora and fauna in surface waters will vary both within RBDs due to the physical differences in habitats and also regionally across Europe due to geoclimatic variations.

The WFD addresses this issue by dividing the EU into a series of 'ecoregions'. For rivers and lakes Ireland shares an ecoregion with Northern Ireland (Ecoregion 17), and for estuaries and coastal waters Ireland shares an ecoregion with the UK (Ecoregion 1). For IFI's fish monitoring element in Ireland, three fish groups have been identified and agreed for Ecoregion 17 by a panel of fishery experts **(FIGURE 3)**. In the absence of major human disturbance a lake fish community is considered to be in reference state (in relation to fish) if the population is dominated by salmonids (or euryhaline species with an arctic marine past) (i.e. group 1 fish species (natives) are the only species present in the lake).<sup>7</sup>

<sup>&</sup>lt;sup>7</sup> North South Shared Aquatic Resource (NS Share) Task 6.9: Classification Tool for Fish in Lakes: Plan for Development/Conceptual Model (T1 A6.9 - 1.1).

1. Natives	2. Non-natives influencing ecology	3. Non-natives benign (generally not influencing ecology)
Brown trout	Roach	Tench
Sea trout	Perch	Rudd
Salmon	Pike	Stoneloach
Char	Bream	Gudgeon
Pollan	Dace	
Eel	Carp	
Shad	Rainbow trout	
3-spine stickleback	Chub	
9-spine stickleback	Minnow	
Brook lamprey		
River lamprey		
Sea lamprey		
Flounder		

#### List of the three fish groups identified for Ecoregion 17



Classification and assigning lakes with an ecological status is a critical part of the WFD monitoring programme. It allows River Basin District managers to identify and prioritise lakes that currently fall short of the minimum "Good Ecological Status" that is required if Ireland is not to incur penalties. A multi-metric fish ecological classification tool (Fish in Lakes –'FIL') was developed for the island of Ireland (Ecoregion 17) using IFI and Agri-Food and Biosciences Institute Northern Ireland (AFBINI) data generated during the NSSHARE Fish in Lakes project (Kelly *et al.*, 2008). This tool was further developed during 2010 (FIL2) in order to make it fully WFD compliant, including producing Ecological Quality Ratio (EQR) values for each lake and associated confidence in classification (Kelly *et al.*, 2012).

## **3.2 CASE STUDIES OF INVASIVE FISH IN ECOREGION 17**

#### CASE STUDY 1: Lough Fern, Co. Donegal.

Lough Fern located in Co. Donegal, was one of the great spring salmon lakes until its stocks were hit by UDN (Ulcerative Dermal Necrosis) in the 1970s. However, the salmon stocks were making a slow recovery since then until perch appeared in recent years. Lough Fern is also located within the Leannan River Special Area of Conservation. In 2005, Lough Fern was surveyed as part of the North South Shared Aquatic Resource (NS Share) 'Fish in Lakes' project. No perch were found. In 2008, Lough Fern was surveyed as part of the Water Framework Directive (WFD) Monitoring Programme. No perch were found. In 2011, Lough Fern was surveyed as part of the Water Framework Directive (WFD) Monitoring Programme. No perch were found. In 2011, Lough Fern was surveyed as part of the Water Framework Directive (WFD) Monitoring Programme. No perch were found. In 2014, Lough Fern was surveyed again as part of the Water Framework Directive (WFD) Monitoring Programme. Perch (aged 1+) were found.<sup>8</sup> Therefore, an illegal introduction took place somewhere between 2012 and 2013. Since 2014, IFI haven't made any effort to remove perch nor have they made any attempt to pursue a rehabilitation plan for the lake. Under current legislation, these invasive perch are protected in a natural salmonid fishery within a SAC.

#### CASE STUDY 2: Lough Shindilla (Screebe System), Co. Galway.

Lough Shindilla is the uppermost lake on the Screebe system in Co. Galway, located approximately 0.75km west of Maam Cross. The lake is also located in the Maamturk Mountains Special Area of Conservation (SAC). The lake used to hold a good stock of brown trout and got the occasional run of sea trout and salmon (O'Reilly 2007). Lough Shindilla was surveyed in 2007 under the WFD surveillance monitoring programme (Kelly and Connor 2007). During this survey arctic char and brown trout were found to be the dominant species present in the lake. Adult salmon, minnow and eels were also captured. The lake was surveyed again in 2010, with arctic char being the dominant species in terms of abundance (CPUE)<sup>9</sup> and perch were the dominant species in terms of biomass (BPUE).<sup>10</sup> This was the first time that perch were recorded in Shindilla and IFI surmised

<sup>&</sup>lt;sup>8</sup> Inland Fisheries Ireland - Sampling Fish for Water Framework Directive - Lakes 2014 - Lough Fern.

<sup>&</sup>lt;sup>9</sup> CPUE (Catch Per Unit Effort).

<sup>&</sup>lt;sup>10</sup> BPUE (Biomass Per Unit Effort).

that the lake was colonised by perch from Ardderry Lough during the floods of 2008 and 2009.<sup>11</sup> No explanation was given in the 2010 WFD report as to why perch were in Ardderry Lough considering its location and morphology. In the same report, IFI acknowledged that "the introduction of this non-native species has the potential to negatively impact the native brown trout and arctic char populations". The lake was surveyed again in 2013 under the WFD programme. Brown trout was the dominant species in terms of abundance (CPUE) and perch was the dominant species in terms of biomass (BPUE). IFI noted that the mean arctic char CPUE and BPUE was substantially lower in 2013 compared to 2010 and 2007, yet they stated that this decrease was not statistically significant.<sup>12</sup> The latest WFD survey of Shindilla was conducted in 2016. The 2016 report noted that perch was now the dominant species in terms of both abundance (CPUE) and biomass (BPUE). The same report also highlighted that the mean arctic char CPUE and BPUE were significantly lower in 2016 compared to 2013, 2010 and 2007.<sup>13</sup> Nevertheless, the 2016 report made no mention on the obvious impact that perch are having on the native arctic char population and one could infer that IFI has no interest in removing the invasive perch or rectifying the sharp decline in char numbers in a SAC.

#### CASE STUDY 3: River Inny, Co. Westmeath.

The River Inny, an order 5 river (Strahler 1952), is one of the major tributaries to the River Shannon. The river is 88.5km long and occupies a catchment area of 782.46km<sup>2</sup> (O'Reilly 2002). The river rises in Co. Westmeath and flows through Loughs Sheelin, Kinale, Derravaragh and Iron before discharging into Lough Ree. Chub (*Leuciscus cephalus (Linnaeus,* 1758)) is a highly prized angling species in Britain and Europe. The absence of chub from the rivers of Ireland, many of which provided an ideal habitat for the species and excellent conditions for the angler, provoked considerable controversy among the visiting angling community. However, it is the stated policy of the Fisheries Boards (IFI) in Ireland to preserve our indigenous and naturalised fishes and to prohibit the introduction of non-native and potentially invasive species (National Policy for the Management, Development and Conservation of Coarse Fish Species in Ireland, Central Fisheries

<sup>&</sup>lt;sup>11</sup> Inland Fisheries Ireland - Sampling Fish for Water Framework Directive - Lakes 2010 - Lough Shindilla.

<sup>&</sup>lt;sup>12</sup> Inland Fisheries Ireland - Sampling Fish for Water Framework Directive - Lakes 2013 - Lough Shindilla - IFI/2014/1-4186.

<sup>&</sup>lt;sup>13</sup> Inland Fisheries Ireland - National Research Survey Programme - Lakes 2016 - Lough Shindilla - IFI/2017/1-4354.

Board, in preparation).<sup>14</sup> In 2001 and 2004 there were unconfirmed reports from anglers that chub had been caught in the River Inny, a major tributary of the River Shannon. No specimens, however, were retained for identification and authentication. In 2005, three live chub were caught in the River Inny and officially identified by fisheries scientists from the Central Fisheries Board (CFB). These fish had probably been illegally introduced to the river by British carp or pike anglers with a view to establishing a population of this species in Ireland.<sup>15</sup>

*"It is probable, however, that, as the chub become more abundant and widespread, they will impact on our native or naturalised fishes. The impact could be direct, through predation, or indirect, by competing for available habitat or for common food items. A further risk associated with the introduction of non-native, invasive species relates to the viral, bacterial or parasitic fauna that these fish harbour (Hoffman and Schubert 1984; Boxshall and Frear 1990; Kennedy 1994; Beyer et al. 2005)".<sup>16</sup>* 

Between 2006 and 2008 the CFB conducted a chub removal operation that was deemed a success by the then CFB CEO Dr. Ciarán Byrne, *"I am delighted that the effective response mounted by the Fisheries Boards to eradicate this invasive species has paid off. Chub posed a major environmental threat to the country. I would like to take this opportunity to remind anglers that it is illegal to introduce non-native species into Irish waters. As custodians of our precious fisheries resource the Fisheries Boards will take whatever action is necessary to remove any introduced invasive fish species and to prosecute any person that is deemed to be responsible for such introductions".*<sup>17</sup>

As of September 2022, chub still exist in the Inny River with IFI issuing a press release on August 25<sup>th</sup> 2020 declaring that chub had made a 're-appearance'.<sup>18</sup>

<sup>&</sup>lt;sup>14</sup> Caffrey, Joe & Acevedo, Silvana & Gallagher, Kevin & Britton, Rob. (2008). Chub (Leuciscus cephalus): A new potentially invasive fish species in Ireland. Aquatic Invasions. 3. 201-209. 10.3391/ai.2008.3.2.11.

<sup>&</sup>lt;sup>15</sup> Caffrey, Joe & Acevedo, Silvana & Gallagher, Kevin & Britton, Rob. (2008). Chub (Leuciscus cephalus): A new potentially invasive fish species in Ireland. Aquatic Invasions. 3. 201-209. 10.3391/ai.2008.3.2.11.

<sup>&</sup>lt;sup>16</sup> Caffrey, Joe & Acevedo, Silvana & Gallagher, Kevin & Britton, Rob. (2008). Chub (Leuciscus cephalus): A new potentially invasive fish species in Ireland. Aquatic Invasions. 3. 201-209. 10.3391/ai.2008.3.2.11.

<sup>&</sup>lt;sup>17</sup> Westmeath Examiner, Tuesday June 30th 2009, Inny's Chub Stubbed Out - Tom Kelly.

<sup>&</sup>lt;sup>18</sup> https://www.thejournal.ie/chub-river-inny-longford-inland-fisheries-ireland-investigation-5185772-Aug2020/

Salmon and brown trout are considered to be at risk from direct competition with *Leuciscus cephalus* (Caffrey *et al.* 2008; Invasive Species Ireland 2010; Caffrey 2013). Brown trout and juvenile salmon occupy habitats utilised by *Leuciscus cephalus* and their dietary range overlaps (Caffrey *et al.* 2008; Invasive Species Ireland 2010; Caffrey 2013). Other important native fish such as rare strains of brown trout (e.g. in Lough Melvin), Pollan and Arctic Char may also be threatened by the introduction of *Leuciscus cephalus* (Caffrey *et al.* 2008; Invasive Species Ireland 2010; Caffrey *et al.* 2008; Caffrey *et al.* 2010; Caffrey 2013).

If chub are found in Lough Corrib SAC, what will the response of DECC officials and IFI be?

#### CASE STUDY 4: Owenriff Catchment, Co. Galway.

The Lough Corrib catchment is the largest and most important wild salmonid catchment in Ireland and Lough Corrib is considered the premier wild brown trout fishery in Ireland (Gargan *et al.*, 2002). Oughterard village is situated on the Owenriff River, which drains a region of approximately 68km<sup>2</sup> and enters Upper Lough Corrib downstream of Oughterard, Co. Galway. The Owenriff catchment is located within two different Special Areas of Conservation (SACs) both of which support two Annex II species of the E.U. Habitats Directive (92/43/EEC), namely Atlantic salmon (*Salmo salar*) and the freshwater pearl mussel (*Margaratifera margaratifera*) (NPWS, 2005).

"Prior to 2009 there were no official records of pike (Esox lucius) being present in the Owenriff catchment upstream of the natural waterfall at Canrawer, Oughterard. There were anecdotal records suggesting that there were pike present in some lakes in the catchment in the 1990s but this was never confirmed by IFI staff and no pike were recorded in the electrofishing surveys of 1997 and 2007 (IFI unpublished data; WRBD, 2008). Gradients in excess of 6.6% (Spens et al., 2007) and 7% (Hein et al., 2011) have been shown to act as barriers to the natural dispersal of pike. The natural waterfall at Canrawer, Oughterard on the main channel of the Owenriff exceeds the published gradient threshold preventing natural colonisation of pike from the established population in Lough Corrib, as do the natural falls on the Clooshgereen and the Glashanasmearny both of which now have pike present in the lakes above these natural barriers (IFI, 2018a). In 2009, pike were captured for the first time by Inland Fisheries Ireland (IFI) staff in two lakes in the catchment (Loughs Bofin and Agraffard) following reports from anglers of pike in the system.<sup>319</sup>

"During the 2017 survey pike were recorded at three river sites including the most upstream sub-catchment and in the two lakes surveyed, indicating a range expansion over the past 20 years. Results from the 2017 survey suggest that pike are present all over the Owenriff catchment, in areas where they can freely gain access and in some areas where they cannot naturally gain access (gradients > 7%)."<sup>20</sup>

"As there are little or no major anthropogenic pressures in the catchment to cause the decline in fish stocks, it is reasonable to infer that the introduction of pike and their subsequent range expansion in the Owenriff catchment (with impacts of competition for food and space and predation on resident and migratory fish) is the main factor causing the decline of brown trout and salmon in the Owenriff catchment. Research from Europe and North America supports this finding."<sup>21</sup>

On November 22<sup>nd</sup> 2019, IFI published a further fish stock survey report on the Owenriff catchment.<sup>22</sup> The report stated the following.

"Pike was the most common fish species recorded in all lakes, followed by eel. Pike and eel were also captured in the fyke nets in both lakes where the two species were recorded. No brown trout were recorded in any of the lakes indicating a possible failure in recruitment or survival in at least the previous few years. In contrast the brown trout captured in Lettercraffroe Lough (also located in the Owenriff catchment, but no pike are present in the lake) during the 2016 survey ranged in age from 0+ to 4+ indicating recruitment success in the previous five years (Kelly et al., 2017). Brown trout in Lough Bofin and Lough Agraffard from the

<sup>&</sup>lt;sup>19</sup> Inland Fisheries Ireland - Owenriff Fish Population Rehabilitation Plan - 2018 - IFI/2018/1-4399.

<sup>&</sup>lt;sup>20</sup> Inland Fisheries Ireland - Fish Stock Survey of Selected Lakes and River Sites in the Owenriff Catchment - 2017 - IFI/2017/1-4396.

<sup>&</sup>lt;sup>21</sup> Inland Fisheries Ireland - Fish Stock Survey of Selected Lakes and River Sites in the Owenriff Catchment - 2017 - IFI/2017/1-4396.

<sup>&</sup>lt;sup>22</sup> IFI (2019) Fish Stock Survey of Selected Lakes and River Sites in the Owenriff Catchment, 2018. National Research Survey Programme, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

2017 survey were aged at 2+ (IFI, 2018a). Definitive conclusions are difficult to determine for all four lakes surveyed due to the limited number of fish recorded. However, brown trout were not recorded in each lake, but they are still present in Lettercraffroe (a lake within the Owenriff with no pike present) and in neighbouring catchments (Loughs Doo, Glencullin, Kylemore and Lettercraffroe) where pike are also not present."

With respect to the Water Framework Directive (WFD) and the impact of invasive coarse fish on the Owenriff's ecological status, IFI had the following comments to make in the same 2019 report.

"Using the FIL2 classification tool, Loughaphreaghaun, Lough Adrehid, Lough Ateeann and Lough Shannaghree were assigned a fish ecological status of Bad for 2018 based on the fish populations present. Reasons for the failures were mainly due to the absence, lower than expected abundance or missing age classes of type specific indicator species (i.e. brown trout). In contrast lakes in neighbouring catchments where there are no pike present, such as Glencullin Lough, Doo Lough, Kylemore Lough and Lough Shindilla, were assigned a fish status of High and Ardderry Lough was assigned a fish status of Good (see www.wfdfish.ie). The EPA has also assigned high status to Lough Bofin; however this status assignment does not incorporate fish status (EPA, 2017)."

#### CASE STUDY 5: Ross Lake, Co. Galway.

Ross Lake is situated in the Corrib catchment, located approximately 1km south-east of Rosscahill and 3km north-west of Moycullen, Co. Galway in a chain of lakes entering Lough Corrib at Moycullen Bay. Ross Lake and the surrounding woodlands have been designated as a Special Area of Conservation (SAC) for containing a hard water lake, a habitat listed on Annex I of the EU Habitats Directive (Council Directive 92/43/EEC) (NPWS, 1999). The lake supports communities of *Chara pedunculata* and *Chara curta*, both of which are characteristic of marl lakes such as Lough Carra in Co. Mayo. Ross Lake was surveyed in September 2016 as part of the WFD (Water Framework Directive) surveillance monitoring programme and roach were found to be the dominant species in terms of abundance (CPUE) and roach/bream hybrids were the dominant fish species in

terms of biomass (BPUE).<sup>23</sup> No brown trout were found in 2016 or during the previous WFD surveys conducted in 2007, 2010 and 2013.

Ross Lake was once a famed trout fishery that had its own self sustaining wild population.<sup>24</sup> Since the introduction of various invasive coarse fish including pike and roach, the native trout population have ceased to exist. Ross Lake is now a de-facto coarse fishery with a mayfly hatch but <u>no salmonids</u> present in a SAC lake.

#### CASE STUDY 6: Lough Corrib, Co. Galway.

Lough Corrib the second largest lake in Ireland (after Lough Neagh), is situated in Co. Galway in the River Corrib catchment. The lake stretches from outside Galway city to within three kilometres of Maam Cross, a distance of over 50 kilometres. The main rivers draining into Lough Corrib include the Black, Clare, Dooghta, Cregg, Owenriff rivers and the Cong canal which joins Lough Corrib to Lough Mask. The lake can be divided into two parts; Lower Lough Corrib - a relatively shallow basin underlain by carboniferous limestone in the south and Upper Lough Corrib - a larger, deeper basin underlain by more acidic granite, schists, shales and sandstones to the north (NPWS, 2004). Since 2008, the lake has been surveyed under the WFD (Water Framework Directive) surveillance monitoring programme. During the summer of 2011, IFI conducted the second WFD fish survey. One tench (*Tinca tinca*) was captured in a fyke net on Upper Lough Corrib.<sup>25</sup> This discovery should have set off alarm bells but IFI at the time decided to bury the fact in an obscure WFD report. No tench were discovered in a subsequent WFD survey (2014). On March 4<sup>th</sup> this year during stock management operations on Lough Corrib another tench was caught in gill nets in the Ballycurrin/Salthouse area.<sup>26</sup>

As of September 2022, riparian anglers can conclude that a self sustaining population of tench exist in Lough Corrib. Have IFI formulated any contingency plans to remove these invasive fish? Why did IFI attempt to protect this species in 2018 under proposed legislative amendments considering that the potential presence of tench is the result of an

<sup>&</sup>lt;sup>23</sup> Inland Fisheries Ireland - National Research Survey Programme Lakes 2016 - Ross Lake - IFI/2017/1-4366.

<sup>&</sup>lt;sup>24</sup> Went, Arthur E. J. "The Pike in Ireland." *The Irish Naturalists*' *Journal*, vol. 12, no. 7, 1957, pp. 177–182. *JSTOR*, JSTOR, www.jstor.org/stable/25534470.

<sup>&</sup>lt;sup>25</sup> Inland Fisheries Ireland - Sampling Fish for the Water Framework Directive Lakes 2011 - Lough Corrib - IFI/2012/1-4069.

<sup>&</sup>lt;sup>26</sup> FOI Request 493-22-CW released by Inland Fisheries Ireland.
obvious illegal introduction (no tench were captured in the major fish stock surveys of 1986 and 1996) and the presence of tench in Lough Corrib SAC is in contravention of the EU Habitats Directive conservation objective's?

### CASE STUDY 7: Lettercraffroe Lough, Co. Galway.

Lettercraffroe Lough is located 6km south-west of Oughterard, Co. Galway on a tributary of the Owenriff River which flows through the town and into Lough Corrib. Lettercraffroe Lough is also situated within the Connemara Bog Complex, a large Special Area of Conservation (SAC) site that encompasses a wide range of habitats, including extensive tracts of blanket bog, heath, woodland, lakes, rivers and streams.<sup>27</sup> The lake was the subject of a WFD survey in 2007, 2010, 2013 and 2016. The surveys showed that roach are now the dominant species in terms of biomass and CPUE (Catch Per Unit Effort). Yet in 2008, the Western Regional Fisheries Board (WRFB) produced a fish stock survey report of the entire Owenriff System that stated the following:

"The presence and dominance of roach in Lettercraffroe lake is unacceptable and illustrates the need for improved bio-security planning in order to prevent unauthorised fish introductions, alien species infestations and fish disease transfers. Options should now be considered with regard to methods for the removal of the roach population from Lettercraffroe Lake."<sup>28</sup>

As it stands over the last fourteen years, the WRFB, CFB or IFI have made <u>no</u> effort in removing invasive roach from this once famed trout fishery as described by T.C. Kingsmill Moore in his celebrated book 'A Man May Fish'. Furthermore, should any angler remove five roach or any roach above 25cm in length from Lettercraffroe Lough then that angler would be breaking the law (Coarse Fish Conservation Bye-Law No. 806 of 2006) and potentially liable to a fine plus confiscation of their fishing gear used. Is this obscene and contradictory policy fully supported by IFI staff, the IFI Board, its CEO, DECC and the Principal Officer within the Inland Fisheries Division?

<sup>&</sup>lt;sup>27</sup> Inland Fisheries Ireland - National Research Survey Programme Lakes 2016 - Lettercraffroe Lough - IFI/2017/1-4360.

<sup>&</sup>lt;sup>28</sup> The Western Regional Fisheries Board, Catchment Wide Fish Survey For The Owenriff River, January 2008.

### CASE STUDY 8: Lough Inagh, Co. Galway.

Lough Inagh is situated in the Ballynahinch system approximately 7.5km north of Recess, Co. Galway. The lake is located in the Inagh valley with the Twelve Pins Mountains rising to the west and the Maumturk mountain range to the east. Lough Inagh is fed primarily from the Tooreenacoona River, which then flows out of the lake into Derryclare Lough.

Lough Inagh is situated within the Twelve Bens/Garraun Complex Special Area of Conservation (SAC). This is an extensive SAC located in the north-west of Connemara and is dominated by mountainous terrain. Geologically, the SAC can be divided into two distinct sections; the Twelve Bens which are composed of quartzite and schists in the valleys and the mountains to the north of Kylemore which are composed of gneiss, sandstones and mudstones (NPWS, 2005). The main soil type within the site is peat. Eight of the habitat types listed in the SAC are found in Annex I of the EU Habitats Directive.

The SAC also contains many species listed on Annex II of the Habitats Directive: freshwater pearl mussel, Atlantic salmon, otter and the plant, slender naiad (NPWS, 2005). Lough Inagh is part of the Lough Inagh and Derryclare Fishery. The lake holds a stock of brown trout and has a spring and grilse salmon fishery and a run of sea trout (O' Reilly, 2007). The lake was previously surveyed in 2002 and 1997 (Gargan and Rogers, 2002). At that time the lake held a stock of Arctic char, brown trout, sea trout, minnow and eel (Gargan and Rogers, 2002). Perch were discovered in the lake in 2016, since then stock management efforts (using perch traps) by IFI have been on-going to remove them from the lake.

In a 2019 Water Framework Directive (WFD) survey conducted by Inland Fisheries Ireland, a total of four fish species (sea trout are included as a separate 'variety' of trout) were recorded in Lough Inagh. Perch was the dominant species in terms of both abundance (CPUE) and biomass (BPUE) captured in the survey gill nets during the 2019 survey. This contrasts with the previous survey in 2002 when brown trout and Arctic char were the dominant fish species in the lake (Gargan and Rogers, 2002).

Arctic char were not captured during the 2019 survey. The Arctic char population may now be so small that it is difficult to capture using conventional sampling methods and could be on the verge of extinction. Introductions of perch and other non-indigenous species cause declines in Arctic char populations and can also lead to extinctions in some lakes (Kelly *et al.*, 2014, Kelly *et al.*, 2017, Connor *et al.*, 2019 and Morrissey-McCaffrey *et al.*, 2018).

### CASE STUDY 9: Aughrusbeg Lake SAC, Co. Galway.

Aughrusbeg Lake SAC is one of the most westerly lakes in the Connemara area of Co. Galway, located approximately 5km west of Cleggan. It has a surface area of 50ha, a mean depth of less than 4m and a maximum depth of 14m. The lake falls into typology class 7 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), less than 50ha and moderate alkalinity (20-100mg/l CaCO<sub>3</sub>).

Aughrusbeg Lough forms part of the Aughrusbeg Machair and Lake Special Area of Conservation (SAC). The site has been selected as a SAC for containing a lowland oligotrophic lake, a habitat listed on Annex I of the E.U. Habitats Directive. The underlying geology of the region is made up of Omey granite (NPWS, 2003). Species recorded from the shoreline of the lake include six-stamened waterwort (*Elatine exandra*), quillwort (*Isoetes lacustris*) and shoreweed (*Littorella uniflora*) (NPWS, 2003). The majority of Aughrusbeg Lough has gently sloping granite shores, with a well developed sand shelf present on the western shore. At the edge of this sand shelf the lake bed falls off steeply to a depth of 6m (NPWS, 2003).

According to archival Inland Fisheries Trust data and O'Reilly (2003), eels and brown trout were the only species present in the lake. However, a recent survey in 2007 as part of the WFD surveillance monitoring programme (Kelly and Connor, 2007) found rudd and eels to be the dominant species present, with three-spined stickleback also recorded.

On Wednesday, August 11<sup>th</sup> last year, Inland Fisheries Ireland issued a press statement confirming that invasive pike had been found in Aughrusbeg Lake SAC for the first time. The confirmation was made during a fish stock survey by Inland Fisheries Ireland research staff.

The introduction of invasive pike to small low-complexity lakes, such as Aughrusbeg Lough, could be devastating to resident fish populations. New introductions are also potentially a carrier of fish disease and parasites, the state agency stated.

Mr. Francis O'Donnell, current CEO of Inland Fisheries Ireland said: *"Ireland's inland waterbodies are ecologically important ecosystems, which support significant recreational fisheries for native and established fish species. 'Introductions' of new species threaten these ecosystems that they support, potentially in unforeseen ways, and are a major cause for concern for Inland Fisheries Ireland."* 

He added: "Unfortunately, a similar introduction of pike into the upper sections of the Owenriff catchment in County Galway over ten years ago caused the virtual collapse of what had been a very important salmonid fishery in the West of Ireland."

Under current fisheries legislation (see Section 4.0), which the Inland Fisheries Division of DECC are steadfastly standing over, these invasive pike are now protected in a SAC. Only this could happen in Ireland with such negligent civil servants operating within DECC.

## 4.0 CURRENT COARSE FISH & PIKE BYE-LAWS

### Conservation of Pike Bye-Law No. 809 of 2006.

On August 3<sup>rd</sup> 2006, the then Minister of State at the Department of Communications, Marine and Natural Resources, Mr. John Browne TD, signed a new national bye-law on the conservation and protection of (invasive) pike in all watercourses. This bye-law contained three wording changes from bye-law no. 805, which was revoked. The new bye-law clarified several issues that were raised by interested parties. The new bye-law superseded the Pike Conservation Bye-Law no. 667, which was in force since 1990. That bye-law allowed for the killing of one specimen sized pike i.e. 20lbs in a river and 30lbs in a lake in any one day. The current bye-law no longer allows this practice and only one pike up to 50cm may now be killed in a day on any watercourse including SACs. All pike taken by fair angling, longer than 50cm must be returned alive to the water in all cases. Another change in the current bye-law is that 0.75kg of pike flesh may only be retained by an angler instead of 1.5kg.

### Conservation of and Prohibition on Sale of Coarse Fish Bye-Law No. 806 of 2006.

Two weeks prior to the new pike bye-law being signed in to legislation, Mr. John Browne TD signed a bye-law protecting (invasive) coarse fish<sup>29</sup> in every Irish water course on July 20<sup>th</sup> 2006. The new bye-law allowed only four coarse fish per angler per day to be retained and no coarse fish above 25cm in length could be retained either. The bye-law also prohibited the sale of any coarse fish in Ireland excluding fishing tackle dealers and fish bait suppliers who have been granted an exemption from their respective regional fisheries board (IFI).

### 4.1 GENESIS OF CURRENT COARSE FISH & PIKE BYE-LAWS

The following extracts (*all in italics*) are from a research essay titled "National Identity, Moral Panic and East European Folk Devils" by Kevin Howard, which appeared in a 2011 academic textbook titled "Globalization, Migration and Social transformation - Ireland in Europe and the World" edited by Bryan Fanning of University College Dublin and Ronaldo Munck of Dublin City University. The research by Kevin Howard gives an in-depth and chronological history of how invasive coarse fish and invasive pike got such comprehensive legal protection by Irish politicians and deficient government officials.

<sup>&</sup>lt;sup>29</sup> "Coarse fish" means any fresh water fish other than pike, salmon, trout , eels or minnow.

In the early 1970s with EEC membership approaching, attention broadened to the potential value of visiting continental anglers. in the context of the debate around the 1970 Fisheries Bill, the Labour Party TD Stephen Coughlan told how a visiting group of French anglers he observed would take:

"Great delight in doing things which we would not bother to do. Some of them would be more elated from catching a perch weighing half a pound than would a man who had caught a 25lb. salmon ... Coarse fish are a menace. We all know the damage both pike and perch do. [However, they could be] a great tourist attraction. There should be a promotional drive in that respect throughout European countries (Coughlan, Dáil Éireann, 2 December 1970)."

Ireland joined the EEC in 1973 and throughout the decade, the economic potential of continental anglers pursuing Irish pike was a recurrent theme. German coarse anglers of which there were an estimated 250,000 were perceived to have far more disposable income than English visitors. In the context of the 1979 fisheries bill, Fine Gael's Patrick Hegarty, echoing the assumptions of 20 years earlier about continentals' taste for pike suggested that Germans in particular, should be encouraged to come here. They would be able to catch and 'make a delicious meal of a fish that we would be likely to throw away' (Hegarty, Dáil Éireann, 18 October 1979). Five years later, in the context of a further fisheries debate, the point was again made that while few in Ireland were bothered with coarse fish, pike in particular, continentals were avid pike anglers. The Fine Gael spokesperson on tourism, Gay Mitchell argued:

"Coarse fishing is frowned on by inland fishermen in this country. It is a lowly thing in the eyes of some anglers to fish for pike. People in Germany and on the Continent generally, they are very much into pike fishing. We have lakes full of pike. Promote it, particularly in areas like Germany and continental countries (G. Mitchell, Dáil Éireann, 22 June 1984)."

From the 1920s to the 1980s then, the themes are quite clear: across the political spectrum, coarse fish particularly pike should not be, and are not wanted, in Irish waters; on the other hand, the English, Germans and other continentals pursue these species and should be facilitated in coming here to fish for them.

### **Piscine Ethnocentrism**

At the same time as parliamentarians were pushing for the promotion of pike angling tourism amongst Germans and other continental anglers, other parliamentarians were lobbying for legislation to protect pike stocks from the apparent threat these continentals posed to these stocks. The claims made in relation to the predations of visiting German and French fishermen were extraordinary, most particularly from parliamentarians who represented areas with a tradition of coarse angling. In late 1986, the Fianna Fáil TD for Cavan-Monaghan, Peter Wilson asked the 'Minister for Tourism, Fisheries and Forestry the steps he is taking to ensure that the pike stocks in County Cavan will not be completely depleted by continental anglers' (emphasis added, Wilson, Dáil Éireann, 25 November 1986).

The mainstream media expressed similar disquiet. The Irish Independent ran a story claiming that 'several border lakes had been "totally cleaned" out of coarse fish recently'. The chairman of the Dublin Pike Anglers club claimed:

"Continentals are now arriving here in droves, equipped with nets, a multitude of rods and freezer boxes. The fish are then sold on the Continent, so it all adds up to a cheap holiday here with little benefit to the tourist sector (Moffat, Irish Independent, 12 January 1987)."

Yet in the three years 1985–1987 inclusive, the fisheries boards removed nearly 60,000 pike at a cost to the state of £IR184,000 (offset to some extent in that dead pike were sold on to fish dealers for £IR1 per kilo). During the economically depressed mid 1980s, the state was spending considerable sums to remove pike wholesale while introducing legislation to limit the alleged retail-scale activities of continental anglers, who were being encouraged to come to Ireland in the first place, to fish for a species which many Irish anglers, politicians, academics and popular opinion had traditionally regarded as an invasive nuisance. Yet as Table 12.2 shows, legislation has emerged to protect coarse fish, pike in particular. Crucially, in each case, this legislation was a direct response to the claims made about the threats which foreigners posed to the stocks of coarse fish.

Measure	Date	Legislation	Proscription		
1	1986	Conservation of Pike By-law No. 654	e By-law No more than three fish taken in one day, no more than 10 allowed in possession at any one time		
2	1990	Conservation of Pike By-law No. 654	Only one pike, no more than 6.6lb (3kg), per angler, per day, allowance made for 'specimen' fish		
3	2006	Conservation of Pike By-law No. 809, 2006	Only one pike can be killed per angler, per day, and this must no longer than 50cm in length		
4	2006 Conservation of and Prohibition on Sale of Coarse Fish Bye-law No. 806, 2006		No more than four coarse fish, none of which can be longer than 25cms (4ins)		

Table 12.2 Legislative protection of pike, coarse fish

Source: Drawn from data at Dáil Eireann.

One of the reasons for these contradictory dynamics was the beginnings of an indigenous pike angling lobby, which was adopting the English practice of 'catch and release' in the context of a fisheries management tradition and a game angling culture that was extremely hostile to pike. The Dublin Pike anglers referred to above had been founded as early as 1970. The bulk of Ireland's pike angling clubs however were formed in the 1980s and 1990s. In January 1988, 15 of them came together to form the Irish Federation of Pike Angling Clubs (IFPAC). From that beginning membership has risen to 94 clubs (IFPAC 2009). One of the IFPAC's key aims is to have the pike 'assigned the status of indigenous species', an ongoing and ideologically loaded debate. Nevertheless, the lobbying of IFPAC, stressing in particular the predations of foreigners, contributed to the introduction in 1991 of further legislation to protect pike stocks (Measure 2, Table 12.2).

By the mid 1990s 'catch and release' had become the hegemonic normative framework for club-based, organised pike angling and for coarse anglers more generally. The establishment of 'catch and release' reached a watershed with the launch in 1999 of the Sligo-based Irish Angler's Digest. The magazine set out to 'provide a forum for an exchange of views about various topics of interest'. For the first few years of the periodical's life, the perceived threats to coarse fish were the usual suspects: algae bloom, water extraction, effluent from farming activity; littering by Irish anglers and of course 'the Continentals'. Nonetheless, in the main, the tone of the magazine was positive and upbeat. All forms of angling, and the commercial activities that surrounded them, seemed to be doing well. However, the wider context was changing rapidly. In 1996, Ireland experienced net migration for the first time since the late 1970s. The net migration of the 1970s comprised Irish emigrants returning home. For the last few years of the 1990s that pattern was very similar, ethnic Irish returning. By the early 2000s the composition of the migrant stream was much more diverse. From the perspective of Ireland's coarse anglers, these newcomers were quite different to Germans on vacation. There were far more of them; they weren't in Ireland on holiday and they seemed to want to catch and eat any and all species of freshwater fish. In short, they were not anglers, they were fishermen. Thus, while the fisheries boards continued to cull pike, water quality continued to deteriorated, extraction for building increased, the sole variable for the perceived decline in coarse fish stocks, and the attendant threat to tourism became the undifferentiated category 'East European' immigrants.

The highpoint of the panic was 2005, the year after accession. In the January 2005 edition of Irish Anglers Digest, the IFPAC warned readers that 'into the cauldron of abuse of Irish pike, has come a barrage of illegal and immoral practices designed to indiscriminately remove any fish that swims. The simple facts speak for themselves.' The authors did not refer specifically to East Europeans, that was left implicit. April 2005 was the first time the term 'non-nationals' appeared; used in relation to what the IFPAC saw as the government's reluctance to 'consider the wholesale taking and killing of coarse fish by non-nationals as a major problem'. IFPAC went on 'it does not do our tourist industry any good when visiting [English] anglers [a more morally advanced type of non-national] go back with tales of specimen bream, tench, etc, being bar-b-queued on the lakeshore' (Irish Anglers Digest, 2005, vol. 6, no. 12:21). By July of that year, the IFPAC's chairperson was more explicit:

"We now have a large population of Eastern Europeans who traditionally eat coarse fish .... To prohibit members of this significant community from catching and eating coarse fish could be viewed as wrong and discriminatory. Fish removal should be controlled. The total ban on the taking of coarse fish would be unworkable and possibly discriminatory. Bag limits for coarse fish should be introduced (Chambers, IAD, July 2005, 47)."

The IFPAC didn't want a total ban on the taking of coarse fish because their members used small fish as pike bait. Nevertheless, they were still anglers, pursuing fish for sport, not harvesting them for food:

"What really annoys anglers at present is the illegal methods used by many nonnationals to catch fish. A week rarely goes by without reports of non-nationals being seen setting nets or longlines. In many cases they use dinghies, arrive on lakes at dusk and again at dawn. It does not take them long to lay the long lines or remove the fish (ibid., p. 48)."

In May 2006 the magazine reported on a meeting the previous month of a coalition of angling interest groups brought together to suggest a campaign of political lobbying. The meeting was told that 'fresh, frozen and smoked roach, bream, pike etc, can be purchased in many shops including some in Moore Street' (Irish Angling Digest, May 2006: 35). While no evidence of this was given the same edition showed photographs of dead coarse fish, caught up in nets, and allegedly dumped on the bankside by East Europeans. Dead fish, on a fishmonger's slab or in a supermarket's fish section, is one of the few remaining authentic presentations of animals as foodstuffs. In the main, animal products are presented for human consumption packaged, in other words, 'disembodied'. Thus, in and of themselves, pictures of dead fish might be regarded as quite neutral. The difference of course is that in the pages of Irish Anglers Digest coarse fish are not food; they are sporting quarry that should be returned to their habitat alive, to fight another day. Such photographic imagery therefore is highly emotive and those responsible are quite easily identifiable.

### The Legislators' Campaign

Throughout 2005 and 2006 the push for legislation gathered pace, most particularly though not surprisingly by opposition TDs. In April 2005, the Green Party had gotten on board the campaign for raising the legal status of coarse fish. The Party's leader Trevor Sargent tabled a question in the Dáil to the Minister for Communications, Marine and Natural Resources, as to 'when legal protection of coarse fish, in addition to the protection afforded to the pike species, in order to protect stocks from destruction [would be introduced] (Sargent, Dáil Éireann, 27 April 2005). The Fine Gael TD Olwyn Enright tabled a number of written questions (March and June 2005, January 2006) calling on the government to introduce legislation compelling 'catch and release'. In March 2006 the independent TD from the Cavan-Monaghan constituency Paudge Connolly sought an adjournment debate, 'to discuss the following matter of urgent public and national concern, namely ... the threat to inland coarse fishery resources ... from illegal fishing

activity and stock depletion (Connolly, Dáil Éireann, 23 March 2006). Not to be outdone, Sinn Féin's TD for the same Cavan-Monaghan constituency, Caoimhghin Ó Caoláin, tabled a question to encourage a 'catch and release' ethos as a way of protecting 'coarse fish stocks which are under threat from illegal fishing' (Ó Caoláin, Dáil Éireann, 28 March 2006). Connolly followed up a month later will a similar question. In May 2006 Green Party TD Eamonn Ryan pressed the government to introduce 'a "catch and release" system for pike angling in the interests of preserving stocks here' (Ryan, Dáil Éireann, 3 May 2006). In July, Ireland's semi state electricity provider, the Electric Supply Board (ESB) announced that 'catch and release' was to be practised in the waters it controlled.

### Legislative Catharsis

While the government had deflected requests for legislation with the response that fish protection was a matter for the fisheries boards, in July 2006 it relented. Two bye-laws were introduced, Measure 3 and Measure 4 in Table 12.2 above. Measure 3 further strengthened the protection of pike, Measure 4 offered the first ever protection for all forms of coarse fish. Thus by 2006, all coarse fish had come under the Dáil's protection. As we have seen, each legislative step was taken to protect fish against foreign predation.

The Irish Anglers Digest was jubilant, 'Protection – at last' ran the headline in the edition which followed the introduction of the legislation (Vol. 8, no. 6, October 2006). The introduction of the legislation appears to have had a cathartic effect for the authors of the magazine. Its November 2007 edition featured pike fishing in Poland which raved about the abundant and rich waters; the state run restocking programmes; the efficient administration and policing of fishing licences, ending with a paen to the wonderful Poles. Since then, there's been no negative mention of the 'East European' threat. Indeed, the February 2007 edition contained a piece on how the pike fishing scene in Ireland had changed over the last two decades. How it had become populated by diverse types of anglers, the most common of which was the xenophobic-piker, 'a character who first raised his head in the mid-1990s'.

"The recent past has provided xenophobic-piker with a new wave of targets from the accession states. Basically, a latent racist, if he fails to catch a pike, then it's not the fault of the weather, water, the bait, or even his angling prowess – 'the

# Bosnians' [anyone from east of Calais] are always to blame (Farrell, IAD, Vol. 8, no. 10, 2007, p. 5)."

Yet despite the protective legislation, the fisheries boards continue to cull pike. An anomaly not lost on the Mayo TD Michael Ring who queried the policy with the Minister for Communications, Marine and Natural Resources. On foot of the 2007 general election in Ireland this was now the Green Party's Eamonn Ryan. In 2008, his party colleague Mary White<sup>30</sup>, suggested to the Minister that coarse fish stocks were in imminent danger of collapse' adversely affecting 'a valuable source of tourism for rural areas' (White, Dáil Éireann, Vol. 650, 13 March 2008). Ryan responded to the effect that the threat was overstated. There had been a few localised examples of fish stocks being exploited as a food item. 'However, this relatively new practice has not had a significant impact on coarse fish stocks nationally ... the main problem appears to be perception. In Ireland, we are not used to seeing our coarse fish killed and eaten ... domestic anglers are commonly angered when they witness this practice' (Ryan, Dáil Éireann, Vol. 650, 13 March 2008).

In addition to Minister Ryan's downplaying of the apparent danger to actual fish stocks, research by Fáilte Ireland (Irish Tourist Board) suggests that the apparent threat to tourism may also have been exaggerated. For the seven years 2002–2008 inclusive, neither coarse angler numbers nor visitors satisfaction rates with the quality of angling in Ireland showed any significant declines. During that period, the number of visitors engaging in coarse angling averaged around 29,000 (Fáilte Ireland 2007, 2009), much the same as in the late 1960s. The same source recorded that slightly less than 12 per cent of those surveyed indicated they were not satisfied with the quality of the angling. Indeed, the majority, 57 per cent, indicated they were very satisfied.

It is true that there has been some turning away from Ireland as a coarse fishing venue, not least by pike anglers. However, this cannot be blamed on recently arrived East European immigrants. In 2002, the Pike Anglers' Club of Great Britain made a submission to the Central Fisheries Board which stated that:

"For many years a great number of our members, plus numerous other British pike anglers have visited the various loughs and rivers of Ireland to sample the pike

<sup>&</sup>lt;sup>30</sup> In March 2010 Mary White was appointed to the cabinet as a Junior Minister at the Department of Community, Equality with special responsibility for Integration, Equality and Human Rights.

fishing for which it was once famed. However, in recent years most of these anglers have refrained from visiting Ireland to fish, because of the ... dwindling quality of the pike fishing ... It is significant that the recent decline of quality pike fishing on Irish venues coincides with [the fisheries board's culling of] pike in large numbers, this in our view is short sighted and a recipe for fishery suicide! (PAC 2002)."

The ambivalence towards the pike, its 'native' status, and the consequent policy of culling it to protect the indigenous salmonids profoundly alienates the very constituency the Conservation of Pike Bye-Law no. 809, 2006 was introduced to protect.

### Conclusion

There is a long history of illegal fishing in Ireland, not least in the border counties. As long as there have been riparian rights of exclusion, people have poached and, if caught, punished. Eighty years before Alfonsas Zilius was convicted of illegal fishing, Pat McConnell appeared in court in Cavan charged with fishing illegally. He was netting bream (a coarse fish) for food in a river to which he had no access rights. Mr McConnell pleaded guilty on the basis that he didn't think he was doing anything wrong. The judge decided to treat him leniently (Anglo-Celt, 23 October 1926). In the 1980s it was the continentals 'cleaning out our rivers and lakes' (Anglo-Celt, 10/1987, 13), as well as 'faceless get rich quick merchants from Northern Ireland'.

Moral panics are the acute manifestations of a chronic moral indignation (Young, 2009, 7). As we have seen, since at least the 1980s, the activities of foreigners taking fish for food were the source of this indignation. In the context of the mass immigration of mid 00s this indignation became acute. The future is open and we cannot perceive how the large-scale immigration of the 00s will impact on Irish national identity. What we can see is the rapidity with which the core ethnic group can alter the legislative and administrative context to compel cultural compliance from foreigners. At the core of Irish national identity is a profound ethnocentrism. An obvious ethnocentrism informs the 2006 legislation. Yet all identities are constructs and the more flexible these constructs are, the more resilient they are likely to prove. In this specific example, the normative framework East Europeans transgressed is itself an example of transnational cultural syncretism; the English practice of 'catch and release' repackaged as traditionally Irish. The criminalisation of East

Europeans' fishing and dietary practices was justified on the basis of the perceived threat these posed to Ireland's coarse fishing stocks.

## 4.2 COARSE FISH/PIKE BYE-LAWS IN SACs SUBVERT EU LAW

As discussed in previous sections, the Conservation of Pike Bye-Law No. 809, 2006 and the Conservation of and Prohibition on Sale of Coarse Fish Bye-Law No. 806, 2006 are national bye-laws that cover all lakes, rivers, streams, ponds etc and including Special Areas of Conservation (SACs). The legal basis on which SACs are selected and designated is the EU Habitats Directive (92/43/EEC) was initially transposed into Irish law in 1997 and is now covered by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended. The Habitats Directive contributes to ensuring biodiversity in the European Union by conserving natural habitats and wild fauna and flora species. It sets up the 'Natura 2000' network, the largest ecological network in the world. Natura 2000 comprises **Special Areas of Conservation** designated by EU countries under this directive and **Special Protection Areas** classified under the Birds Directive (Directive 2009/147/EC).

Any plan or project that is likely to have a significant effect on a Natura 2000 site must be subject to Appropriate Assessment Screening (AAS) under Article 6(3) of the Habitats Directive. Competent authorities may only agree to a plan or project after having ascertained that it will not have a significant impact on the integrity of a Natura 2000 site. Some projects that will cause significant negative impact may still be permitted, in the absence of other alternatives, for imperative reasons of overriding public interest (including those of a social or economic nature). Where this arises, EU countries must introduce compensatory measures to ensure the overall coherence of the Natura 2000 network. This procedure is regulated under Article 6(4) of the Habitats Directive. Article 6(3) of the EU Habitats Directive provides the following:

"any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only". The Lough Corrib Pike Research & Control Group has availed of legal advice from a Senior Counsel, which concludes that there is no basis to limit the range of the term "**any**" in Article 6(3) in its preface to "plan or project". Thus, the two Bye-Laws No.s 806 and 809 of 2006 are a plan (or project) and therefore they trigger the Article 6(3) requirements, and should be subject to Appropriate Assessment Screening (AAS), as it arises in circumstances, which are not necessary for the management of Natura 2000 sites. It is logical to conclude that any such AAS may result in the requirement for a full Appropriate Assessment to be done on the Bye-Laws themselves.

Neither department officials nor the now defunct Central Fisheries Board conducted Appropriate Assessment Screenings<sup>31</sup> on these two Bye-Laws for any of the 439 Irish SACs<sup>32</sup> that may include freshwater catchments prior to implementation. Therefore, the Conservation of Pike Bye-Law No. 809, 2006 and the Conservation of and Prohibition on Sale of Coarse Fish Bye-Law No. 806, 2006 are fundamentally **illegal** as they contravene both the EU Habitats Directive and the current domestic European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

Accordingly, the two Bye-Laws are also in breach of Article 6(2) as DECC are not taking appropriate steps to avoid, in SACs, the deterioration of natural habitats for which salmon etc are designated. Instead, DECC has adopted measures through secondary legislation that are causing such deterioration.

Furthermore, on July 27<sup>th</sup> last year in response to a Parliamentary Question (PQ) regarding the proposed draft 2021 Salmonid Bye-Law asked by Máiread Farrell TD, Minister Ryan stated the following:

"In parallel, the Department has tendered for an independent Appropriate Assessment (AA), in line with the requirements of the EU Habitats Directive to be undertaken to bring independent professional advice to bear on potential impacts of the bye-law on the conservation objectives of the waters concerned. The final draft bye-law will be subject to legal advice".

<sup>&</sup>lt;sup>31</sup> Oughterard Anglers Association, pers. comm., November 2019 - Fol and AIE requests.

<sup>&</sup>lt;sup>32</sup> https://www.oireachtas.ie/en/debates/question/2019-09-19/261/.

A 2018 fisheries Bye-Law was revoked on this very issue. On October 25<sup>th</sup> 2018, the Designated Salmonid Waters Bye-Law No. 964 of 2018 was signed in to law by Richard Bruton TD (Fine Gael). British and Irish pike angling lobbyists challenged the Bye-Law in the High Court, case no. 441 MCA (2018). The case never went to non-jury trial presided over by Mr. Justice Seamus Noonan as the state's legal team never defended the Bye-Law as the requisite Appropriate Assessment Screenings (AASs) were never completed. As a consequence, the Bye-Law was annulled under Section 57 of the Inland Fisheries Act 2010 on February 25<sup>th</sup> 2019 **(FIGURE 4)**.

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Figure 4. 2019 High Court annulment of Salmonid Bye-Law No. 964 of 2018.

Last August, IFI as the statutory body made a submission to DECC regarding the public consultation on the 2021 Draft Designated Salmonid Waters Bye-Law. IFI made the following comments in relation to the Coarse Fish Conservation Bye-Law No. 806, 2006 and the Pike Conservation Bye-Law No. 809, 2006:

"In fact these Bye-Laws have resulted in fish species which have become "naturalised" in these lakes are now afforded equal protection to the native species which have been there since the retreat of the last ice age. This is contrary to the aims of the Habitat Directive and fisheries legislation in general".

Why are these two Bye-Laws still on the Irish Statute Book?

## **5.0 SALMON & TROUT STOCKS IN LOUGH CORRIB SAC**

As stated previously, Atlantic salmon (*Salmo salar*) use the lake and rivers as spawning grounds. Although this species is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II/V of the EU Habitats Directive.

The annual salmon run through the fish counter at the Galway salmon weir is estimated to be 50% of the total run as salmon ascend through the open gates at the weir. The count recorded by the fish counter is doubled annually to provide a total estimate of the salmon run.<sup>33</sup> For example, the total salmon run for 2015 was estimated at 18,952 salmon. The salmon conservation limit for the Corrib is 7,572 fish. The available surplus of salmon for the 2017 season was 5,470 salmon. The available salmon surplus over the five year period (2013 to 2017) on the Corrib system ranged from 4,235 to 6,250 salmon.

Year	2013	2014	2015	2016	2017
Salmon Surplus	4,235	6,250	4,966	5,227	5,470

Based on the above data, the Corrib salmon run is sub optimal but relatively stable in recent years in spite of the problems within the SAC and with marine survival values (ICES 2016).

The scientific advice and management policy in Ireland is to allow salmon stocks to return to individual rivers below conservation without commercial or angling harvest. The harvesting of salmon is only permitted in rivers with an identifiable surplus. This policy ensures the best chance of recovery of depleted salmon stocks and allows the continued propagation of genetically distinct populations within each stock.

The former Central Fisheries Board (CFB) operated a commercial salmon fishery at the cribs on the Corrib River since purchasing the fishery in 1978. In 1999, all commercial salmon fishing ceased on the Corrib and salmon entering the river had free access. Ireland ceased mixed stock drift net fishing at the end of 2006 season. This action coupled with the closure of the commercial traps on the river meant that there has been no interception of Corrib salmon returning since 2006. At sea, the commercial salmon

<sup>&</sup>lt;sup>33</sup> J. Conneely 2017, WRBD Director, Inland Fisheries Ireland, pers. comm., June 22<sup>nd</sup>

fishery at the Faeroes has not operated since the 1980s and the Greenland commercial salmon fishery is on a strict quota for subsistence use only. Therefore, there is little to no interception of Corrib salmon returning and a quota is in place on the river, which allows salmon to be taken on rod and line while protecting the number of salmon required to spawn annually. The official line from IFI and DECC is that the Corrib system has been substantially above conservation limit in recent years.

Taking all this evidence at face value, there are some some pertinent questions that remain unanswered.

Firstly, why are IFI and by extension DECC pushing a 'catch and release' agenda as a conservation tool for salmonids through various social media platforms? If we examine the Corrib salmon data for 2015, IFI were willing to allow anglers to harvest approximately 25% of incoming salmon stock and still have a sustainable population within the Corrib system. By allowing this high percentage of harvesting, IFI are implying that the angler is not having a negative impact on overall stocks. If this is the case, why is there such a spotlight on promoting 'catch and release' and the continual latent message that if an angler returned more fish alive then there would be no issues with salmon stocks or wild fish in general. Either the angler is having a negative impact or not. The contradictory policy of IFI shoving 'catch and release' angling down every anglers throat through the 'CPRsavesfish' campaign while simultaneously selling harvesting licences (blue gill tags) to the same anglers is laughable. IFI are only making a mockery of themselves and the expert scientific advice that underpins quotas.

This duplicitous position on 'catch and release' angling was further compounded by a statement made by Mr. Fintan Gorman (former IFI Chairman) in the published Wild Salmon and Sea Trout Statistics Report 2019 (IFI/2020/1-4513). Mr. Gorman stated the following, *"given the status of the species(salmon) there is clearly scope for improving the level of catch and release angling"*. If the former IFI Chairman was so concerned about the impact of rod and line harvesting on wild salmon, why did he and the IFI board sign off on the sale of blue harvesting tags every year? Was he afraid that IFI would lose major revenue from the cash cows of the Corrib and Moy fisheries if Irish salmon angling went full 'catch and release'?

Let us examine another indigenous Corrib salmonid in brown trout. Corrib trout stocks are currently very healthy and stable with respect to the last major Corrib fish survey in 2012 and the various WFD surveys that have taken place in 2008, 2011, 2014, 2018 and 2021. The 2021 WFD survey for Lough Corrib has not been published by IFI to date.

The following statement was made by IFI in March 2012 regarding Lough Corrib:

*"If excessive angling catches were responsible for reducing trout stocks in recent years then a significant reduction should be seen in the numbers of larger older fish in the 2012 survey – this is not the case. It is the smaller fish, not the larger individuals, which are poorly represented in the stock".*<sup>34</sup>

If these categorical statements with respect to Corrib trout stocks are made in official reports, why is there a concerted effort currently being made within the Inland Fisheries Division of DECC and IFI to amend the Western Fisheries Region Conservation of Trout Bye-law No. 840 of 2008 by lowering the daily bag limit from four trout to two. It appears that DECC want to solve a problem that doesn't exist. If this push towards lowering brown trout bag limits and full 'catch and release' angling on Lough Corrib is being portrayed as a conservation effort, then no quantitative scientific evidence<sup>35</sup> exists to support it. Therefore, what is the hidden agenda? Currently, there is no bag limit for brown trout on Loughs Conn and Cullin in Co. Mayo, which form part of the 'Great Western Lakes' grouping with Corrib, Mask, Carra, Arrow and Sheelin. The lack of bag limits on these lakes show that there is no rationale or consistency to the legislative conservation strategies employed by DECC and by extension IFI in the West of Ireland.

Secondly, why have DECC or IFI failed to produce annual Appropriate Assessment Screenings for <u>individual</u> SAC lakes and rivers, which are covered by the Wild Salmon and Sea Trout Tagging Scheme Regulations. As comprehensively discussed in Section 4.2 of this submission, these annual regulations trigger the EU Habitats Directive Article 6(3) requirements and should be subject to Appropriate Assessment Screening.

<sup>&</sup>lt;sup>34</sup> Inland Fisheries Ireland - Preliminary Observations in Relation to an Adult Fish Stock Survey of L. Corrib completed in February/ March, 2012 - IFI/2012/1-4097.

<sup>&</sup>lt;sup>35</sup> Oughterard Anglers Association, pers. comm., November 2019 to present - Fol and AIE requests.

In November 2020, DECC published for the first time ever a generic Appropriate Assessment Screening (AAS) produced by the private sector for the current Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations. However with respect to Lough Corrib SAC, this AAS never examined the major impact that invasive pike are having on the Owenriff River, an important Atlantic salmon nursery. Also, the AAS never examined the role that other invasive coarse fish such as roach, perch, bream etc are having on juvenile salmon. If legally challenged in the High Court could this AAS stand up to scrutiny? Why was this AAS completed by a private sector company, INVAS Biosecurity Ltd. and not the appropriate statutory body being IFI?

If the necessary Screenings were conducted properly on the Wild Salmon and Sea Trout Tagging Scheme Regulations for the Lough Corrib SAC, provisions would be made for the serious decline in Atlantic salmon stocks entering and leaving the Owenriff system and the resultant negative consequences for the freshwater pearl mussel, another Annex II species (see Section 2.1). While IFI have produced an 'Owenriff Fish Population Rehabilitation Plan' in 2018, no meaningful work has taken place since to protect Atlantic salmon stocks in the system apart from a pike radio tracking survey. DECC and IFI seem to be maintaining the illusion that because relatively consistent numbers of salmon are returning to the Galway Weir each year then everything is rosy in the garden. This is far from the truth.

## 6.0 SEA TROUT & LOUGH CORRIB SAC

Sea trout is the common name usually applied to anadromous or sea-run forms of brown trout (*Salmo trutta*), and is often referred to as *Salmo trutta* morpha *trutta*. The sea trout, also widely known as 'white trout' or 'breac geal' in Irish, can be found in rivers, loughs and estuaries throughout Ireland. Other names for anadromous brown trout are sewen/ sewin (Wales), peel or peal (SW England), mort (NW England), finnock (Scotland), and salmon trout (culinary).<sup>36</sup> In essence, sea trout are sea-going brown trout.

Most Irish sea trout are females, with their male partners often remaining behind in rivers as resident brown trout. Sea trout/brown trout breed in autumn when river temperatures reach about 6 degrees centigrade, usually in October/November. Most are coloured but late-running fish may still be silver-sided.

While the Lough Corrib SAC is not recognised as a sea trout fishery, its importance in producing a small number of sea trout should not be underestimated. From records currently available to hand, it is very difficult to ascertain the numbers of sea trout running the Corrib River over the last twenty to thirty years.

"Sea trout numbers were generally low during the season. Up to the end of May water levels fluctuated up and down with numbers difficult to assess, as angling was restricted at times due to high water conditions. From mid-June onwards levels stabilised at one gate up to the third week in July. Water levels fluctuated thereafter for the remainder of the season and it was difficult to observe numbers of fish present in the system. While staff observed some small numbers of decent size seatrout on the camera in the Weir Pool, and anglers encountered some sea trout while fishing for salmon, numbers overall were generally poor"<sup>37</sup>.

According to the available IFI Salmon and Sea Trout Statistics Reports, there were 13 sea trout landed in the Corrib catchment in 2010, only one in 2013 and none for the years 2014 and 2015. Furthermore, the annual IFI Fishcounter Reports noted that 6 sea trout passed through the Galway weir in 2015 and none in 2016.

<sup>&</sup>lt;sup>36</sup> Everard, Mark. *Britain's Freshwater Fishes*. Princeton: PUP, 2013, p. 84.

<sup>37</sup> Inland Fisheries Ireland - Galway Fishery Newsletter 2015.

The Wild Salmon and Sea Trout Statistics Report 2019 (IFI/2020/1-4513) published on November 2<sup>nd</sup> 2020, shows that 3 sea trout were caught and released on the Corrib system for the year 2019.

The whole Galway coastline was once famous for the sea trout that it supported. Though badly affected by salmon farms and sea lice, the southern Galway Bay area though not as prolific as the north of the bay still holds stocks of sea trout particularly around Kinvara and Ballyvaughan Bays. In 2016, a sea trout weighing 6.5lbs was captured on August 16<sup>th</sup> in the inner Galway Bay area.<sup>38</sup>

All sea trout in the Galway Bay caught by rod and line must be released alive under legislation. Considering that there has been a consistent catch and release policy for sea trout over the last twenty odd years yet stocks have never recovered. One could reasonably argue that catch and release angling is a societal issue and nothing to do with the conservation or enhancement of wild fisheries.

<sup>38</sup> Annual Report of the Irish Specimen Fish Committee 2016.

## 7.0 LOUGH CORRIB SAC STOCK MANAGEMENT OPERATIONS

Stock Management is undertaken/required on certain systems for the conservation of salmonids in waters, which are managed by IFI as salmonid fisheries. Such waters are identified in IFI's pike and trout management policies. These stock management operations are informed by scientific research, are based on best international practice and carried out in accordance with IFI's pike and trout management policies under strict standard operating procedures. Stock management in relation to invasive pike on Lough Corrib has been carried out by IFI and its predecessors; the Western Regional Fisheries Board, the Inland Fisheries Trust and the Corrib Fisheries Association since 1898. The targeted predation of salmonids by pike has been observed and described by many professionals working in the inland fisheries sector both in Ireland (O'Grady & Delanty, 2008) and in other states and regions where pike are considered as non-native and invasive e.g. Alaska (Sepulveda et al, 2013) and Sweden (Byström et al, 2007). This is particularly so in the spring months when juvenile salmon and trout migrate from feeder streams to larger freshwater bodies. Pike are an invasive predatory fish that can reduce stocks of salmon and trout and their numbers are managed on certain wild trout fisheries that are recognised as internationally important.

Stock management is an intrinsic component in the conservation management of a Natura 2000 site, ie. Lough Corrib SAC. A report published by the National Parks and Wildlife Service (NPWS) in relation to protected habitats and species, highlight pike as a potential threat to the status of Atlantic salmon in some Irish water-bodies designated under the EU Habitats Directive (NPWS, 2007). This report specifically refers to the Corrib catchment. Pike are also regarded by Inland Fisheries Ireland as a non-native species within the context of the EU Water Framework Directive (IFI, 2018)

When considering the above and bearing in mind that Atlantic salmon are classified as an Annex II and Annex V species in the provisions of the EU Habitats Directive, coupled with Atlantic salmon being a qualifying interest of this SAC, management of pike stocks is necessary in the Corrib catchment as it designated as Lough Corrib SAC.<sup>39</sup>

<sup>&</sup>lt;sup>39</sup> Inland Fisheries Ireland - Screening for Appropriate Assessment - Lough Corrib Stock Management Plan 2021 - Page 6

## 8.0 CONCLUSIONS & RECOMMENDATIONS

- 1. If IFI in conjunction with DECC are going to implement proper universal conservation measures for wild salmonids on the Great Western Lakes, they must firstly designate in law without ambiguous wording <u>all</u> of our salmonid fisheries in the state, not just the seven lakes listed in this current draft plan. The prospective legislation must be properly prepared with Appropriate Assessment Screenings (AASs) and/or Natura Impact Statements (NISs) by IFI where necessary unlike the incompetent preparation and bungling due diligence of the revoked 2018 Designated Salmonid Waters Bye-Law No. 964. Potential legislation must be robustly defended if legally challenged and in all likelihood it will be challenged by British pike/coarse angling lobby groups through their proxy Irish organisations. All salmonid lakes outside the the seven listed in the draft plan some of which are highlighted in Section 3.2 of this submission will be effectively thrown to the wolves by not being included in this draft management strategy. For example, is the IFI CEO happy to see Lough Inagh (SAC) become a world class invasive perch fishery or Aughrusbeg Lake (SAC) an invasive pike dominated wasteland?
- 2. Secondly, current fisheries legislation such as the 806 and 809 Bye-Laws of 2006 must not conflict with or contravene the conservation objectives of the EU Habitats and Water Framework Directives. The bizarre situation whereby invasive coarse fish such as pike, roach, perch, bream, tench, dace, chub, various hybrids etc being protected in salmonid fisheries must end. Is it morally acceptable that pike, which are classed as non-native<sup>40</sup> to Ireland under the WFD have more protection under current guestionable legislation than our native Atlantic salmon? Please note that it is perfectly 'legal' for an angler to harvest a 30lb wild Atlantic salmon if in possession of a valid salmon licence but a 30lb invasive pike is untouchable under 'law'. The 806 and 809 Bye-Laws as currently worded also validate the presence of invasive coarse fish no matter where they are deliberately introduced in the future including SACs. The 806 and 809 Bye-Laws are illegal and must be revoked. The IFI CEO is perfectly aware of the situation. Not alone are the 806 and 809 Bye-Laws repugnant to current Irish and EU legislation but they were formulated in 2006 on the basis of perceived threats, false facts and latent racism by pike/coarse angling lobbyists. How could DECC in the most hypocritical manner attempt to designate the seven Great Western Lakes as 'primarily

<sup>&</sup>lt;sup>40</sup> AA Screening - Lough Corrib Stock Management Plan 2019 - Inland Fisheries Ireland

salmonid' through secondary legislation in 2021 while simultaneously protecting invasive coarse fish in the very same lakes?

- 3. All future freshwater fisheries legislation must be compliant with the EU Habitats, Water Framework and Strategic Environmental Assessment Directives and all necessary Screenings must be completed rather than the mishmash of contradictory and illegal legislation that DECC/IFI presently presides over. The question must be asked, is any inland fisheries legislation currently on the Irish Statute Book fully compliant with EU Directives?
- 4. Water bodies with non-native invasive coarse fish species such as pike will not meet high status for Water Framework Directive purposes due to the presence of these species. Future introductions of non-native species will also lead to a downgrading of the ecological status of a water body. Stricter border controls especially in the post Brexit era and strengthening of existing legislation for moving these species internally in Ireland is required immediately. Legislation currently exists under Regulation 49 (Prohibition on introduction and dispersal of certain species) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477). We are calling on DECC/IFI to add all invasive coarse fish (covered by the 806 & 809 Bye-Laws) including zander (Sander lucioperca), barbel (Barbus barbus), wels catfish (Silurus glanis) and topmouth gudgeon (Pseudorasbora parva) to the Third Schedule (Part 2A) of S.I. 477, which already lists chub, dace, roach and carp. No additional legislation is required. Heavier fines and custodial sentences are also required if individuals are found transporting these invasive species into Ireland and within the country. An interesting footnote to S.I. 477 of 2011 is the absence of pike from the Third Schedule (Part 2A). During a consultation held on the draft regulations in 2011 by the Department of Environment, Heritage and Local Government, IFI made a submission requesting that pike be added to the Third Schedule<sup>41</sup>. Why were pike deliberately left off this list (Third Schedule) but still are classed as 'non-native influencing ecology' under the EU Water Framework Directive (WFD)?
- 5. Proper staffing to be put in place by IFI and proper funding to be provided by the DECC to carry out the 'Owenriff Rehabilitation Plan'<sup>42</sup> to eradicate <u>all</u> invasive pike

<sup>&</sup>lt;sup>41</sup> AIE request AIE-0105-2021. Department of Housing, Local Government and Heritage.

<sup>&</sup>lt;sup>42</sup> IFI (2018) Owenriff Fish Population Rehabilitation Plan.National Research Survey Programme, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

from the Owenriff. Under the EU Water Framework Directive, the state is legally obliged to remove these pike, as they are invasive to the SAC. Due to the lobbying by Lough Corrib stakeholders over the last six years, the grave threat to the remarkable polymorphic Owenriff salmonid population has gone from latent to visible. DECC and IFI had a decade of forewarning on this issue, in addition the previous IFI CEO may go down as the individual who single handedly oversaw the demise of Owenriff salmonids after years of deliberate procrastination. We are also calling for DECC to release more funding to IFI to deal with the recent introduction of invasive pike to Aughrusbeg Lake, another SAC water deliberately seeded with invasive pike by malicious pike anglers.

- 6. IFI must immediately end its duplicitous position on the status of pike in Ireland. On October 15<sup>th</sup> 2013, Ms. Suzanne Campion of IFI issued an online press statement<sup>43</sup> declaring that pike were native to Ireland. Over two years later, on December 10<sup>th</sup> 2015, Dr. Cathal Gallagher, IFI Head of Research and Development, in a submission made to the Department of Environment, Community and Local Government regarding Significant Water Management Issues in Ireland (SWMI), stated categorically that pike were non-native to Ireland. In 2019, IFI reconfirmed that pike were non-native in an AAS conducted for invasive pike removal operations on Lough Corrib (Special Area of Conservation-SAC 000297). How can a statutory fisheries authority make such contradictory public statements with no rational explanation forthcoming and expect to be a credible organisation in the eyes of game angling interests? As of this date, the angling information website (www.fishinginireland.info) run by IFI still claims that pike are native to Ireland.<sup>44</sup>
- 7. IFI must end its self defeating and hypocritical policy of releasing all pike 85cm or greater in length during annual stock management (pike control) operations on the designated trout fisheries. IFI or its legacy organisations have never produced <u>any credible scientific evidence</u> showing that releasing 'Big Old Fat Fecund Female Fish (BOFFFF)'<sup>45</sup> i.e. large hen pike would benefit a salmonid lake such as Lough Corrib. How can a statutory fisheries authority produce an AAS for Lough Corrib stock management operations, which states clearly that the presence of pike are a negative

<sup>&</sup>lt;sup>43</sup> https://www.fisheriesireland.ie/Press-releases/new-study-reveals-pike-native-to-ireland.html (legacy)

<sup>44</sup> https://fishinginireland.info/2013/pike-reports/32589/

<sup>&</sup>lt;sup>45</sup> Shephard, Samuel. (2019). Re: Which fisheries are managed with a maximum size limit or harvest slots (both max and min size)?. Retrieved from: <u>https://www.researchgate.net/post</u>

Which\_fisheries\_are\_managed\_with\_a\_maximum\_size\_limit\_or\_harvest\_slots\_both\_max\_and\_min\_size/5d15e9f8f0fb6227d1741a77/ citation/download.

in the Lough Corrib SAC and then have a contradictory policy of releasing alive all large fecund female pike caught in gill nets? The mind boggles.

- 8. All open cage salmon farming in Galway Bay and its environs must immediately cease. How long more can successive Irish governments and civil servants in the relevant state departments be seen to promote the conservation of wild salmon stocks while simultaneously championing the growth of sea based Irish salmon farming?
- 9. The seven 'High Level Objectives' contained within the Draft Great Western Lakes Management Plan are admirable targets but they will be exercises in futility, while the fundamental issue of non-native/invasive freshwater fish receiving legislative protection in Ireland is continually ignored by state actors. The perfect example of this are the current buzzwords of 'water quality', which are being bandied about. Any advancements in water quality will not offset the damage caused by the protection and proliferation of non-native/invasive freshwater fish in Ireland.

The Lough Corrib Pike Research & Control Group,

September 20th 2022.

info@loughcorrib.ie

"Northern pike are a problem, not an opportunity".

From: Sent: To: Subject:

Tuesday 20 September 2022 15:19 Western Lakes Plan The Draft Management Plan for the Great Western Lakes - Submission 20/09/2022

To whom it may concern;

I would like to make the following observation. It would be ludicrous to carry out costly refurbishments on the Catchment System only for pike to eat all the salmonids that result from the investment.

Pike amalgamate at the entry points of the spawning rivers into the lake. They ambush the adult and juvenile salmonids as they are richer in energy that roach and other cyprids. The scale of this predation on **second** is massive and totally understated by the pike angling representatives. We find that in every 12 pike caught, at least one or more will have a salmonid in it's stomach. It is estimated that there are over 80,000 adult pike on **second**. If they eat one trout/salmon per week for every 12, that demonstrates that over 6,500 trout and salmon are eaten per week by pike. In a year, that equates to 338,000 trout and salmon.

If we divide this statistic by half (which would be an exceptional allowance) the **still losing** is still losing over 150,000 trout and salmon per year to pike predation. And our government protects pike!!

Remove Bye Laws 806 and 809 now, so that anglers can assist the I.F.I. in their efforts to control these voracious predators.

Yours,

From: Sent: To: Subject:

Tuesday 20 September 2022 15:46 Western Lakes Plan western lakes plan

To whom it may concern,

My name is **a second of the se** 

In 2006 when by-laws 806 and 809 were introduced I was involved with my local angling club and made representations to WFB, due to concerns I received by many overseas anglers who were adamant they would not return to **Example** to fish, as they wished to retain their catches. Unfortunately by-laws 806 and 809 have led to the collapse of overseas course angling and has contributed hugely to the reduction of salmon and trout numbers and is in total breach of the habitats directive.

POLLUTION; The lack of a cohesive plan by state agencies on pollution has further led to the deterioration of the western lakes. I fully support the plan to take on enforcement officers in IFI to try and address some of the deficits on protection from pollution i.e agri, forestry, population.

STOCK MANAGEMENT; Due to the system and many others being wiped out by pike, our smaller spawning systems are all the more important and need to be protected and enhanced with the addition of an increase in general operatives. I have read the McLoone report and Dr.Pedreshi's genetic study and I feel as though all science can be manipulated and I don't agree with their findings.

Hopefully IFI and the heads of the Department of Environment will honor the commitment the state made to the habitats directive.

Yours Sincerely,

1

From: Sent: To: Cc: Subject:

Tuesday 20 September 2022 16:40 info Western Lakes Plan Ref: IFPAC Observations and Submission on Proposed Scope of the WLMP SEA Consultation

Ref: IFPAC Observations and Submission on Proposed Scope of the WLMP SEA Consultation

WLMP SEA Consultation, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin D24 CK66

20<sup>th</sup> September 2022

Dear Sir/Madam,

On behalf of the Irish Federation of Pike Angling Clubs, please note that at 1.52pm today, we submitted a submission document titled 'P220901\_001 IFPAC Submission on WLMP and Scope of SEA' to the 'GWLMP Public Consultation' regarding the draft Plan for the Long-Term Management of the Great Western Lakes.

Please note that Section 4 and Section 5 of the submitted document contains submission items and background information that we feel is relevant to the scope and level of detail required in the Strategic Environmental Assessment Scoping and Final Report.

As such, we propose that Inland Fisheries Ireland considers Section 4 and Section 5 of the submission document in full, and incorporates them into the Strategic Environmental Assessment Scoping Report and the Final Report regarding the draft Plan for the Long-Term Management of the Great Western Lakes and into any future plans or projects related to the management of any of the Great Western Lakes by Inland Fisheries Ireland.

Thank you.

Yours sincerely,



IFPAC

## Federation of Irish Salmon & Sea Trout Anglers

Conaidhm na Slát Iascairí Bradáin agus Breac Geal

VINT US AT WWW.fissta.com

#### www.linsta.com

F.I.S.S.T.A.

### Chairmant Secretary

PUBLIC CONSULTATION SUBMISSION TO INLAND FISHERIES IRELAND DRAFT LONGTERM PLAN ON THE PROPOSED DESIGNATED SALMOND WATERS OF THE GREAT WESTERN LAKES AS PUBLISHED IN JUNE 2022 - IFI/2022-4618

Submitted from the FISSTA Secretariat in Donegal 19th September 2022 to:: westernlakesplan@fisheriesireland.ic

FISSTA, the Federation of Irish Salmon and Sea Trout Anglers are Ireland's all island salmon and seatrout angling body impresenting the majority of the 20,000 club anglen, and the sport on the many salmon and seatrout rivers that pay millions in rod license revenue to finance the state fishenes authorities on both north and aouth of the border. We are founding and an accredited NGO member of NASCO, which we attend along with 40 other NGO's from nineteen other salmonid countries annually, of whom many are envious of our salmonid resource and are monitoring this public consultation of this Designated Salmonid Lakes Plan and management process internationally at present. The Department and IFL attend and advise the EU party on behalf of freland at this venue which took place last June for four days in Edinburgh.

FISSTA welcomes the Government's genuine intention by the Minister, through IFI This Time and not his Department, to introduce greater protection in designaling Salmonid waters in the proposed Draft Plan as published on August 10\*2022, which includes 49 pages of the Draft Plan, 26 pages of the SEA Scoping Report and 83 pages of the Invas Screening Stage 1 Appropriate Assessment Report, Press releases, Briefing meetings details and questionnaire which amounts to uver 170 pages that took almost a year to prepare and for IFI to expect a professional and constructive response from our federations by September 20\*\* is unreasonable to the point of discouragement while our wild salmonid waters everywhere in instand, are left unprotected while non-native species are afforded the protection under Byelaws 806 & 809 which must be removed immediately. IFI can never defend this environmental and economic threat to our wild brown trout and salmonid habitat any longer.

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"Committed in Conservation"

FISSTA have read and debated the above documentation, and we see it as a deflection to confuse and therefore will not engage or comment in detail in this submission until the obvious omission is rectified and the key sentence is inserted F.I.S.S.T.A.

While we acknowledge the depth of work developed over a year that now him been submitted as a proposed roadmap to achieve our objectives of last year, we must state clearly this plan will not provide this intended protection and management responsibility that is required to safeguard these unique and important habitats while a mixed stock coarse fishery is being accepted. The EU Habitats Directive has long protected the integrity of our SAC's and our salmonid species, but this draft plan will now undermine it without a shadow of a doub!

Last August, you may remember, in our submission to the Dept byelaw public consultation, we asked Minister Ryan to do two things to rectify the proposed bye law,

we proposed the following because we had trust in Inland Fisheries Ireland.

- This proposed draft Bye Law will not achieve the objective of protecting our unique salmonid habitat as it proposes to transfer the management responsibility from Inland Fisheries Ireland to the Minister unless the entire Section 7 is deleted.
- We would also require that the Minster removes the word "primarily" from Section 4 which reads: "The designated waters shall be managed priminily for the benefit of wild salmonid species, to read as follows: "The designated waters shall be managed for the benefit of wild salmonid species."

Thankfully, the general angling public and our members agreed with these requests and further plans for the proposed Bye Law from the Department was dropped in a press release of September 2<sup>rd</sup> 2022 and was to be replaced by the IFI Draft Designated Salmonid Lakes Plan with *"its proposal to develop an evidence-based management plan for the seven lakes and to submit timelines for the plan to the Department by the end of September"* - within 28 days on September 30° 2022, which led us to believe that we should have at least had a draft before November or Christmas.

We can only speculate on what has delayed this Draft Plan which was already the product of a public consultation, and surely would not have mented another public consultation without an Appropriate Assessment being done and included to comply with the IFI legal responsibilities. The Invas report on screening dated July 2022 is designed to confuse, as it seems to make an attempt to argue that an Appropriate Assessment is not required but it does not appear to follow the correct methods and quidelines.

> Xan, Greathanach Observation XVCO - Neith Yiland, Yoland Constructions Organisms Investor Meetings, XVM - Neith Manue (Edimon Fault E. O. Franzishi Andrea Minne, 2009) have One Second Warran Ware. Step Edimon Dedimon New Company, Sylmond Sourcement Programme - new Borts (2009).

> > "Committed to Construction"

Whatever the delay, we had hoped and trusted the eventual outcome would reflect the spirit of the 152 submissions out of the 180 that had the one theme that supported the call for legislation to designate our Western Lakes as salmonid lakes as laid down in the programme for Government.

F.I.S.S.T.A.

Inland Fisheries Ireland's (IFI) very own submission summarised it very well, when it stated on page 3 under a heading of CONFLICTING BYELAWS that

"it is evident, that unless the lakes in the Schedule to the draft bye law are excepted from the provisions of the two Byelaws – namely Byelaw 806 and Byelaw 809 of 2006, the byelaw it stands, does not achieve its stated aim of protecting the wild brown trout status of the lakes. In fact these byelaws have resulted in fish species which have become 'naturalised' in these lakes are now afforded equal protection to the native species which have bee there since the retreat of the last ice age. This is contrary to the aims of the Habitat Directive and fisheries legislation in general."

Indeed, the entire five pages have some excellent management plan points for a Designated Salmonid Lakes Plan that we enclose it in its entirety below, for your consideration.

Also, the Coarse Fish Conservation Bye-Law (No. 806) and the Pike Conservation Bye-Law (No. 809) continue to conflict with Ireland's legal obligations under the EU Habitats Directive and Water Framework. Directives. Under the EU Water Framework Directive, IFI have been surveying takes and rivers since the late 2000's using the FIL2 model, which classifies pike and most coarse fish as "non-native influencing ecology" for Ecoregion 17 (Ireland). Water bodies with non-native invasive fish species will not meet high status for EU Water Framework Directive (WFD) purposes due to the presence of these species. Future introductions of non-native species will also lead to a downgrading of the ecological status of a water body.

We are also aware through our membership who submitted multiple FOI and AIE requests to both IFI and their parent government department that no appropriate assessment screenings were conducted on the two byelaws (806/809) when they were formulated in 2006. These bye-laws constitute a plan as laid down by articles 5.3 and 6.4 within the EU Habitats Directive. The screening requirement for bye-laws was confirmed in the Dail by Minister Eamon Ryan on July 27th 2021 when responding to a PQ With no screenings these two incumbent bye-laws are legally inadmissible and are completely at odds with the 'precautionary principle' laid down by the EU Habitats Directive.

Some Contractions and O'Despirers in NeWeyll's Neural Advance Statement and Contractional Sciences (New York: Versity Advance Statement Frank E.S.): Comparison Sciences (New York: New York: New York: New York: Comparison Science (New York: New York: Comparison Science (New York: New York: N

"Committed in Conversation"

Without the insertion of this wording. IFI and the government will continue to stand over two bye-laws that encourage and reward through conservation the spreading of invasive pike/coarse fish throughout the country including the deliberate targeting our salmonid SACs?

F.I.S.S.T.A.

Therefore, we appeal to you as the state body responsible for the protection, conservation and management of the inland lishenes resource to include in the draft plan for the long-term management for the seven lakes, the above principled wording shaded in yellow along with spirit of the enclosed five pages from your submission to the Minister of last August.

The lakes have long-been designated, as a matter of policy, to be managed primarily as wild brown trout waters. Therefore, the proposed management programmes for these lakes, as set out in the draft plan, will protect, conserve and, where possible, enhance the lakes' natural attributes and native biodiversity if this key principle is inserted to comply with the EU Habitats Directive

We look forward to continuing to work with the Minister and his staff, and IFI to improve and enhance our wild salmonid habitat.

FISSTA FISSTA FISSTA Federation of Irish Salmon & Sea Trout Anglers Considium na Slat Iascairí Bradáin agus Breac Geal

Familier Manharo, NAM., Nuch Adama, Satura Land, J.A.Y. Longago, Adams Galance, Miles, 2019. Europhys. Science J. and J.J. A. Longago, Adams Phys. Rev. D 10, 1011 (2019).

"Committed to Conservation"


## APPENDIX 1 of 3. - FISSTA BRIEFING NOTE:

At the IPT webinar tonight last Winforday 14th September 2022, Noel Carr Secretary of PISSTA tabled the following question to Declan Conke in the course of his presentation. However, it was the CEO Francis O' Donell what asked to respond what quoted the following: strands from the plan for clarification. E.I.S.S.T.A.

Question to IFI Lorraine O' Donnell to put to Declan Cooke during Webinuir:

"Would IFI agree that unless the 7 lakes in the plan are excepted from the provisions of the two Byelaws – namely Byelaw 806 and Byelaw 809 of 2006, the byelaw as it stands, does not achieve its stated aim of protecting the wild brown trout status of the lakes. In fact these byelaws have resulted in fish species which have become 'naturalised' in these lakes are now afforded equal protection to the native species which have been there since the retreat of the last ice age. This is contrary to the aims of the EU Habitats Directive and Water Framework Directive and fisheries legislation in general."

1FI CEO Mr Francis O' Dormell agreed quoting the following from the draft plan.

#### Page 22

This plan recommends the removal of any legislative protection conterned on pillo (e.g. Bye-law 809) in waters where they are newly introduced. It also recommends that teams of (E) officers are deployed to manage and remove pille rapidly, if they are discovered in previously uncolonized waters. This legislation should also be reviewed to waters that are specifically designated for salmonids.

#### Page 38

Although it is unlikely that any changes in angling exploitation of roach in the western lakes will have a significant impact on their numbers, it is recommonded that the protection conferred upon them under type-law 806 (Conservation of and Prohibition on Sale of Coarse Fuh, Bye-Law 806 2006) is removed in these catchments as an additional measure to help somewhat reduce numbers if the evidence base indicates that this will be beneficial to wild brown trout.

Page 40

The management of pike stocks has been ongoing for over 5 decades, on the western lakes. This has always been regarded as an important management tool for the conservation of salmenies. Research by IFI (Kennedy et al 2018 - https://doi.org/10.1111/jfb.13676) indicated that lake entry is beliesed to be a pike predation bottleneck for salmonids in natural systems, further suggesting that targeted stock management may be more beneticial. It is intended that these management programmes will be continued but may be subject to modification as our understanding of sponter interaction is improved by sampling and population modelling. Through this process, a series of management "levers" will be developed, and these will be applied to various degrees on the different lakes, to bring about more effective stock 39 management processes. Containation may also be given to a review of the current Conservation of Pike Bye-law No. 809, 2006 which conters topotetial legal protection on pike with regard to their exploitation by angling. This may be inappropriate on lakes which are being managed specifically for salmonids or where pike have been recently introduced.

Speed Line and Charles and a WANCE "Source Scheme and the second statement of the second statement

"Committed to Conservation"

The long delay in getting this draft plan to publication.

# Parliamentary Question Tuesday, 26 April 2022

Questions (317)



Éamon Ó Cuív Question:

317. Deputy Éamon Ó Cuív asked the Minister for the Environment, Climate and Communications when he received the draft management plan from Inland Fisheries freland in relation to a number of lakes including Lough Corrib; when he intends taking action, including legislation if necessary in the content of implementing this plan, and if he will make a statement on the matter. [20856/22]

View?.005wert

Written answers (Question to Environment)



Musicur, for the Environment, Climits and Communications

Infand Fisheries Ireland (IFI) has, at my request, set out a draft Management Plan specifically for the 7 Western Lakes, including Lough Corrib, in the context of the Programme for Government. The first proliminary draft of a comprehensive, evidence-based management plan for the Lakes, was submitted by IFI to my Department in mid-Octuber 2021. Following detailed consideration of the preliminary draft plan and wide-ranging discussions with IFI, the draft plan was further developed. The revised draft was received from (FI in late February.

My Officials are continuing to work closely with IEI in this matter and I expect that the finalesed draft plan will be put out for public consultation shortly by IEI.

FISSTA have a question to the Minister seeking detailed further information on who delayed the process and for what reasons did the Minister did not receive this Draft Plan until July 2022.

Tuesday 20 September 2022 16:47 Western Lakes Plan

RE: IPS Observations and Submission - GWLMP Public Consultation

Dear Sir/ Madam,

I am sending a download link to the IPS submission document as your email system has said it is too big to be accepted. Please refer to email below also.

https://www.dropbox.com/s/sxncuwc3zfqxxv6/P220901\_001%20Submission%20on%20WLMP%20and%20Scope%2 0of%20SEA%20Rev1\_0.pdf?dl=0

Irish Pike Society www.irishpikesociety.org



#### From:

Sent: Tuesday 20 September 2022 12:20
To: westernlakesplan@fisheriesireland.ie
Cc: 'info@fisheriesireland.ie' <info@fisheriesireland.ie>;
Subject: IPS Observations and Submission - GWLMP Public Consultation

GWLMP Public Consultation, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, D24 CK66

20<sup>th</sup> September 2022

Dear Sir/Madam,

On behalf of the Irish Pike Society, please find attached, the submission regarding the draft Plan for the Long-Term Management of the Great Western Lakes.

We propose that Inland Fisheries Ireland considers the entire attached submission and all appendices and incorporates the entire suite of submission items and supporting information into the following:

- Inland Fisheries Ireland's further consideration of the draft Plan and any future revisions or other plans or projects related in any way to the management of the Great Western Lakes by Inland Fisheries Ireland;
- The Natura Impact Statement for the Plan and any future plans or projects related in any way to the management of the Great Western Lakes by Inland Fisheries Ireland;
- Appropriate Assessments for the Plan and any future Appropriate Assessment Screening Reports and Stage 2 Reports for plans or projects related in any way to the management of the Great Western Lakes by Inland Fisheries Ireland;

It is requested that Inland Fisheries Ireland provides written responses to any queries raised in the submission prior to continuing the public consultation process related to the proposed plan.

Yours sincerely,





From:Sent:Tuesday 20 September 2022 16:47To:infoCc:Western Lakes Plan;Subject:RE: IPS Observations and Submission on Proposed Scope of the WLMP SEA<br/>Consultation

Dear Sir/ Madam,

I am sending a download link to the IPS submission document as your email system has said it is too big to be accepted. Please refer to email below also.

https://www.dropbox.com/s/sxncuwc3zfqxxv6/P220901\_001%20Submission%20on%20WLMP%20and%20Scope%2 0of%20SEA%20Rev1\_0.pdf?dl=0





#### From:

Sent: Tuesday 20 September 2022 12:20
To: 'info@fisheriesireland.ie' <info@fisheriesireland.ie>
Cc: 'westernlakesplan@fisheriesireland.ie' <westernlakesplan@fisheriesireland.ie>; 'mean <Suzanne.Campion@fisheriesireland.ie>
Subject: IPS Observations and Submission on Proposed Scope of the WLMP SEA Consultation

WLMP SEA Consultation, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin D24 CK66 20<sup>th</sup> September 2022

Dear Sir/Madam,

On behalf of the Irish Pike Society, please find attached, the submission regarding the draft Plan for the Long-Term Management of the Great Western Lakes.

Please note that Section 4 and Section 5 of the attached submission document contains submission items and background information that we feel is relevant to the scope and level of detail required in the Strategic Environmental Assessment Scoping and Final Report.

We propose that Inland Fisheries Ireland considers these particular sections in full and incorporates them into the Strategic Environmental Assessment Scoping Report and the Final Report regarding the draft Plan for the Long-Term Management of the Great Western Lakes and into any future plans or projects related to the management of the Great Western Lakes Ireland.





Tuesday 20 September 2022 16:48 Western Lakes Plan Great Western Lakes Development Plan

I welcome this new plan and I hope it can be implemented as we all know how much trouble Lough Corrib and the other Great Western Lakes are in at the moment.

I have fished **Control of** for more than 20 years and I have noticed it's decline year on year. There has been a very sharp increase in the amount of pike,perch and roach and the African pond weed is showing up in new places all the time. Byelaws 806 and 809 are not helpful and need to be abolished for the protection of our trout and salmon stocks.

and the other Great Western Lakes are national treasures and should be treated as such and I hope IFI can restore these lakes as wild trout and salmon fisheries, as such fisheries are so scarce around the world at present.

Regards,



 From:
 Tuesday 20 September 2022 16:50

 To:
 Western Lakes Plan

 Subject:
 Western lakes.

 Hi ,
 The water quality in the second area is and not sustaonable for the fish to spawn in.

 More work needs to be done on the rivers and streams.

 I would like to see more officers working on the second area.

 The lake is v important to the people and the community here.

 The wild trout should be protected.

 Thanks

1

From:	
Sent:	Tuesday 20 September 2022 16:58
То:	Western Lakes Plan
Subject:	submission
-	

I want the lake i.e. **Example to be kept** as a salmon and trout lake as it has a long and very important role to play in the historical cultural and economical wellbeing of **Example 1** and surrounding area

Sent from my iPhone

Tuesday 20 September 2022 17:01 Western Lakes Plan

In relation to this plan re

I supports parts of it , and I appreciate The Good things being done

However in order to save Our Famous Lake and lakes and Please God Keep Them in some sort of Good State for the next Generation a lot of Work has to be done

Number 1: I am not Happy with invasive species, ie. pike and roach, being protected under a bye law.

What protection do native wild Trout and salmon have.

Pike are known predators that have destroyed wild fishing accorss Ireland and indeed the rest of the world. I have no issue with pike fishing, but there are hundreds of course lakes in Ireland. The wild trout left In our Western Lakes need to be protected. A mixed Fishery does not achieve this.

is an SAC and it should be managed as one. The salmonid species need to be protected.

The water quality is of significant importance. The quality of the water in the **second second** area has seriously declined. The plan touches on this but we need to see more IFI officer's enforcing current legislations and prosecuting offenders. I live by the lake for the last forty years and swim a lot and they had been huge huge difference in the water quality especially in the last two to three years. It's nearly got to the stage where you can't swim in it and feel unsafe to do so

I would like to see more work being done on the streams that run into the **second** to create safe spawning and habitual zones for our salmonid species

The Fisheries were doing Great Great Work here , but have lost huge numbers of staff.

Tackling pollution of rivers and streams should be to the fore .

To achieve these goals IFI need more staff on the ground and polices and practices need to be appropriate and effective.

I have traveled a lot of the world and nearly every where I've been people ask about **sector** and it's Greatness in awe to know You live beside it.

It's a True world Gem and So worth Fighting for.

Please God We Will All to do our Best to Save

Please

Yours Sincerely

Tuesday 20 September 2022 21:36 Western Lakes Plan Re: Great Western Lakes Questionnaire

Dear Sirs

I replied to the consultation earlier today and have since spotted a number of typos. I would be grateful if you can substitute the corrected version below:

## **Feedback Details**

Introduction

When you say 'to mitigate against pressures...' this terminology needs to be strengthened. The situation is critical. In late September 2022 approximately 60 rods with experienced fishermen only caught some 6 (six) fish. I fish regularly with 2 rods and have only caught 1 (one) trout this year!

The Great Western Lakes

I live on the Western shore of Lough Corrib and so can only speak from experience of this lake. I am retired and have my boat in the water from May until 2nd week in October each year. I regularly ask myself 'where are they trout? - have they all been eaten by the Pike?

It is sad to see the deterioration of the lake. There seems to be no encouragement for the public to use it.

Speaking to Fisheries operatives they try their hardest to manage the situation but are totally understaffed and seem to be fighting a losing battle.

Lough Corrib is navigable but newcomer boatmen to the lake need better communications with the tourist organisations to warn them of the dangers and to point them to the Chart Book.

Fish

Quite simply Pike seems to have eaten the trout. The situation is deplorable and needs more robust management. As for the salmon? I don't know as I have never caught one in Lough Corrib.

## Stakeholder Engagement

Unless you know the email address of the Secretary of the Lough Corrib Trustees there is no way it seems to contact them concerning broken or missing markers.

There needs to be an easier way - perhaps a single point of contact to contact the managers of the lake.

Fisheries Management and Climate Change I agree with the draft plan.

Water Quality HLO3. Agree strongly

# **Feedback Details**

#### **Invasive Species**

I agree with the draft plan and proposals on invasive species. However the plane does not go far enough in dealing with the problem of Pike? Aggressive steps must be taken to manage the problem and finance must be found to do so.

#### Stock Management

I agree with the draft plan. If we, the users of the lake can help in any way just let us know, Might some spaces on the lake be sealed against Pike in order to allow the trout to mature before release?

Habitat Management I agree with the draft plan

Research, Current Information and knowledge gaps

The lakes in question are obviously important to the quality of life of everyone in Co Galway and every step must be takes to ensure that the water quality remains safe, that invasive species are dealt with and for the future, more research is

required to ascertain how the shore line infrastructure can be improved to encourage more visitors to both the lake and the river for recreational purposes.

Other feedback

FUNDING: Funding for development is urgently required.

The rivers are the lifeblood of the lakes - ways must be found to increase the productivity of the rivers.

A study needs to be made of the quality of the rivers - I'm sure problems will be found!

Lagarosiphon is a severe problem and further research must be made to find solutions to this.

Ban Jet Skis and high speed craft.

Theme General Feedback and suggestions

Timelines / High level objectives

There are many people who are unable to afford a boat or hire a Gillie that might use the lake if it was more welcoming: The younger generations do not seem to be interested in fishing! Apart from simple jumping into the water off a pier there is nothing to tempt them to the lake.

Signage to the lake is not good and needs to be rectified.

Demographics have changed, what are they now in terms of lake usage?

Encouragement and finance are required to build lakeside facilities in a safe harbour for: kayaking, dinghy sailing, instructional activities, perhaps a cafe even? Obviously safety is paramount and so to start this kind of activity perhaps the River Corrib might be more suitable!

Important notice: The names of respondents and their submissions will be published on our website at the end of the consultation process, where appropriate (i.e at the time the document arising from the consultation is published). All personal data is collected, processed and held by Inland Fisheries Ireland in accordance with <u>WLMP Privacy N</u>

Many thanks



On Tue, 20 Sept 2022 at 20:59, Inland Fisheries Ireland <<u>westernlakesplan@fisheriesireland.ie</u>> wrote:



# **Feedback Details**

## Introduction

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^	111111



Wednesday 21 September 2022 07:55 Western Lakes Plan Western lakes plan

To whom it may concern

My hopes for the future of the western lakes is that everything possible is done to keep salmon and trout stocks in good shape , water quality at a high level and to make sure all rivers and spanning ground are well maintained.

Regards

Sent from my iPhone

Inland Fisheries Ireland 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland. D24 CK66

www.fisheriesireland.ie info@fisheriesireland.ie

+353 1 8842 600

STATISTICS INCOME

